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Bibliography on the Climate of Enclosed Spaces, p. 211

# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 7

FEBRUARY, 1956

No. 2



## SPECIAL FEATURE IN THIS ISSUE

### An Annotated Bibliography on the Climate of Enclosed Spaces

by

C. E. P. Brooks and Gwynne J. Evans

Prepared for

U. S. Army Quartermaster Research and Development Center  
Environmental Protection Division

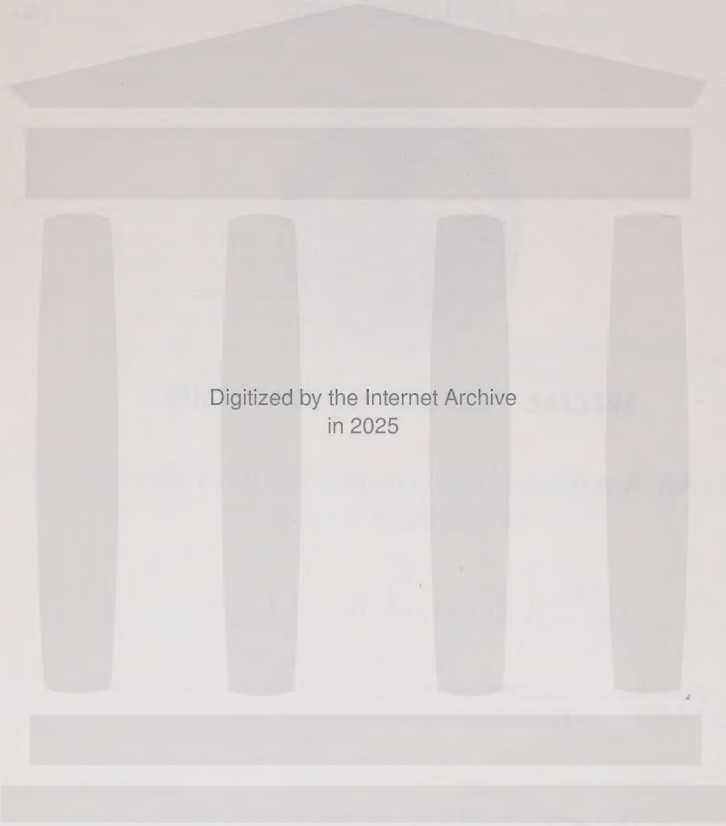
*(For complete table of contents see back cover)*

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## FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of important references on a special subject. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

### Vol. I, 1950

- |                     |                         |                    |                  |
|---------------------|-------------------------|--------------------|------------------|
| 1. Atmos. Pollution | 2. Aerobiology          | 3. Cloud Physics   | 4. Hail          |
| 5. Tornadoes        | 6. Volcanic Dust        | 7. Climat. Changes | 8. Thunderstorms |
| 9. Icing            | 10. Acoust. Propagation | 11. Evaporation    |                  |

### Vol. II, 1951

- |                        |                          |                   |                        |
|------------------------|--------------------------|-------------------|------------------------|
| 1. Extended Forecast.  | 2. Long Range Forecast.  | 3. Soil Temp.     | 4. Constants, etc.     |
| 5. Clim. of Near East  | 6. Clim. of Middle East  | 7. Special Winds  | 8. Radar Storm Detect. |
| 9. Condensation Trails | 10. Clim. of N.E. Africa | 11. Mountain Met. |                        |

### Vol. III, 1952

- |                         |                      |                             |                       |
|-------------------------|----------------------|-----------------------------|-----------------------|
| 1. Clim. of N.W. Africa | 2. Carbon Dioxide    | 3. Clim. of Argentina, etc. | 4. Dew                |
| 5. Objective Forecast.  | 6. Stratus Forecast. | 7. Urban Climatology        | 8. Clim. of C. Africa |
| 9. Visibility           | 10. Glaze and Rime   | 11. Free Air Turbulence     |                       |

### Vol. IV, 1953

- |                      |                          |               |                             |
|----------------------|--------------------------|---------------|-----------------------------|
| 1. Turbulence Theory | 2. Turbulent Diffusion   | 3. Frost      | 4. Clim. of Australia, etc. |
| 5. High Level Winds  | 6. Winds in Stratosphere | 7. Jet Stream | 8. Radiation Bioclim.       |
| 9. Clim. of Pacific  | 10. Auroras              | 11. Sferics   |                             |

### Vol. V, 1954

- |                    |                        |                          |                    |
|--------------------|------------------------|--------------------------|--------------------|
| 1. Oceanog. Met.   | 2. Clim. of S.E. Asia  | 3. Auroral Physics       | 4. Tropopause      |
| 5. Balloons        | 6. Numerical Forecast. | 7. Radiation Data        | 8. Vertical Motion |
| 9. Clim. of Arctic | 10. Industrial Met.    | 11. Wind Waves and Swell |                    |

### Vol. VI, 1955

- |                         |                              |                              |
|-------------------------|------------------------------|------------------------------|
| 1. Bibliog. of Bibliog. | 2. Texts & Monogr. Bibliogs. | 3. Storm Surges              |
| 4. Ionospheric Prop.    | 5. Photochem.—Upper Atmos.   | 6. Cloud Physics             |
| 7. Radar Cloud Physics  | 8. Atmos. Nuclei (1841–1950) | 9. Atmos. Nuclei (1951–1955) |
| 0. Weather Modification | 11. Cooling Power            |                              |

Bibliographies published this year are:

1. Synoptic Meteorology of the Arctic, Vol. 7, No. 1, Jan. 1956
2. Climate of Enclosed Spaces, Vol. 7, No. 2, Feb. 1956

Forthcoming bibliographies will be:

3. Cosmic Rays in the Atmosphere (–1952), Vol. 7, No. 3, March 1956
4. Cosmic Rays in the Atmosphere (1953–1955), Vol. 7, No. 4, April 1956

Other bibliographies in preparation are:

|                              |                          |
|------------------------------|--------------------------|
| <i>Actinometers</i>          | <i>Ozone</i>             |
| <i>Climate of the Arctic</i> | <i>Singularities</i>     |
| <i>Fog Forecasting</i>       | <i>Snow Cover</i>        |
| <i>Microwave Propagation</i> | <i>Synoptic Aerology</i> |
| <i>Night Airglow</i>         | <i>Tropical Cyclones</i> |

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the December issue cumulative author, subject, geographical and journal indexes are published.

## EXPLANATIONS

**Location of material:** For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

**Library symbols** used frequently may be found in the following list:

|        |                                                                  |
|--------|------------------------------------------------------------------|
| DA:    | U. S. Dept. of Agriculture Library, Washington, D. C.            |
| DBS:   | U. S. Bureau of Standards Library, Washington, D. C.             |
| DGS:   | U. S. Geological Survey Library, Washington, D. C.               |
| DLC:   | Library of Congress, Washington, D. C.                           |
| DN-HO: | U. S. Navy Hydrographic Office Library, Suitland, Md.            |
| DSG:   | U. S. Army Medical Library, Washington, D. C.                    |
| DSI:   | Smithsonian Institution Library, Washington, D. C.               |
| DWB:   | U. S. Weather Bureau Library, Washington, D. C.                  |
| GB-MO: | Great Britain, Meteorological Office Library, Harrow, England.   |
| MH-BH: | Harvard University, Blue Hill Observatory Library, Milton, Mass. |

**Other symbols:**

|   |                                                                                |
|---|--------------------------------------------------------------------------------|
| * | before an entry indicates a good data source.                                  |
| † | before an entry indicates a good bibliography.                                 |
| § | before an entry indicates a synoptic case history study accompanied by charts. |

**Geographic locations** are in the English form rather than the form used locally, for example Moscow for Moskva.

**Titles of articles or monographs** are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

**Abbreviations:**

*Titles of periodicals* are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

*Meteorologische Rundschau*, 2(5/6):146-151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, Jahrgang 2 (Vol. 2), Heft 5/6 (No. 5/6), pages 146-151, May/June 1950.

# PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

## MAJOR GENERAL WORKS

### COLLECTED WORKS

See also: **Eighth Report of Comm. for Study of Solar and Terrestrial Relationships** (Int. Council of Sci. Unions), 7.2-19.

7.2-1

551.510.535:012

†Jones, Robert E., **Ionosphere Research**. Pennsylvania. State College, Ionosphere Research Laboratory, Contract AF 19(122)-44, Final Report, March 25, 1949-Jan. 31, 1955. Jan. 31, 1955. 105 p. biblio. Mimeo. DWB—Over 200 reports and scientific papers, which have emanated from this project in 5½ years, are listed and abstracts given on all of the scientific reports. Personnel and history of the project are also outlined. The investigations cover a wide range of studies on the ionosphere, especially the lower ionosphere. These are listed and discussed under the following heads: 1) Low frequency (long wave) studies, 2) Electromagnetic studies (wave solutions, coupling theory and total polarization), 3) Ionospheric physics (solar and high atmospheric physics, D-region viscosity, dynamics of ionized media, effect of vertical ion transport), 4) Ionospheric properties (coupling phenomena, E layer characteristics, ionospheric winds and wave interaction), 5) Applied propagation investigations (oblique incidence studies), 6) Extra terrestrial studies (ring current and electrodynamics of very high atmosphere) and 7) Long wave equipment development. *Subject Headings: 1. Ionospheric research 2. Ionosphere bibliographies.*—M.R.

7.2-2

551.510.535:061.3

†Physical Society, London, **Physics of the ionosphere: report of the Physical Society Conference on the physics of the ionosphere, held at Cavendish Laboratory, Cambridge, Sept. 1954**. London, Physical Society, 1955. 406 p. numerous figs., tables, refs., eqs. DWB. For long review by James Paton see *Royal Meteorological Society, Quarterly Journal*, 81:645, Oct. 1955. DWB—The results of the conference on the physics of the ionosphere held Sept. 6 to 9 in Cambridge are published in a sizeable volume. The 50 articles are grouped under the following main headings: 1) the lowest ionosphere, p. 1-87; 2) irregularities and movements in the ionosphere, p. 88-211; 3) the F2 layer, p. 212-275; and 4) the mathematics of wave propagation through the ionosphere, p. 276-406. Ionospheric physicists from many countries contributed. The first paper in each section comprises a review and bibliography of works in the field. Nearly every aspect of ionospheric research or application is covered in an orderly manner by the variety of articles and the excellent grouping. This compendium, therefore, represents a survey of progress in ionospheric physics up to 1954. The 50 articles by the 52 authors are listed in Pt. III, V. 7, No. 2, p. 271, *MAB*. Individual articles are abstracted separately and will appear in future issues. *Subject Headings: 1. Ionospheric physics conferences 2. Cambridge, England.*—M.R.

### TEXTBOOKS

See also: **Wind** (Zavarina), 7.2-14; **World regional geography** (Heintzelman et al.), 7.2-236.

7.2-3

551.515.1:551.553.8:656.6(023)

Kerr, J. Lennox, **The great storm. Being the authentic story of the loss at sea of the "Princess Victoria" and other vessels early in 1953**. London, G. C. Harrap, 1954. 213 p. 13 plates. DLC—A graphic account of the loss of a number of ships, and the attempts at rescue, on the west and east coasts of Great Britain, during the storm of Jan. 31 and Feb. 1-3, 1953. More nautical than meteorological. *Subject Headings: 1. Storm damage 2. Shipwrecks 3. Great Britain.*—C.E.P.B.

7.2-4

551.582.1 (54,548.7)

\*Spate, Oskar Hermann, **India and Pakistan. A general and regional geography.** With a chapter on Ceylon by B. H. Farmer. London, Methuen, 1954. 827 p. 160 figs., tables, numerous foot-refs., bibliog. at end of most chapters; general bibliog. note, p. xxxiii-xxxvi. **DLC**—In Ch. 2, **Climate** (p. 40-62), the "monsoonal rhythm" (cold, hot, and rainy seasons) and its cause, climatic regions; weather effects on man and agriculture, especially rainfall are discussed with climatic graphs (temperature, rainfall, and wind) and isohyetal chart presented by way of illustration. *Subject Headings:* 1. **Climate of India** 2. **Climate of Pakistan** 3. **India** 4. **Pakistan** 5. **Ceylon**. I. Farmer, B. H.—*M.R.*

7.2-5

551.509.33

Takahashi, Koichiro, **Choki-Yoho.** [Long range weather forecasting.] Tokyo, Iwanami Book Co., Ltd., 1951. 158 p. 39 tables, 41 figs., foot-refs., eqs. In Japanese. **DLC**—Description of long range forecasting according to the author's experience. The 7 chapters are entitled: 1) Seasonal changes, 2) Climatic phenomena, 3) General circulation of the atmosphere, 4) Several types of pressure distribution, 5) Seasonal weather foreshadowing, 6) Weekly weather forecasting and 7) Supplementary remarks. The various Japanese and foreign statistical and synoptic systems in use today are reviewed (e.g., BAUR, CLAYTON, ABBOT, NAMIAS, CHARNEY, MUL'TANOVSKII, WALKER and others). Synoptic climatological "forecasts" (JACOBS) are discussed also. *Subject Heading:* 1. **Long range forecasting.**—*H. Arakawa.*

7.2-6

551.5 (02)

†Kuz'min, Lev Andreevich and Matinian, Gabriel' Bagratovich, **Meteorologicheskie nabludeniia v shkole.** [Meteorological observations in schools.] Leningrad, Gidrometeoizdat., 1954. 147 p. ports., 47 figs., forms, 27 refs. **DLC**—A popular (15,000 copies), but not so simple as one might expect, text or manual for use in high schools or by individuals wishing to observe or forecast the weather from local signs or simple synoptic charts. A brief historical sketch, the importance of meteorology in the national economy, the basic weather elements, instruments, establishing a simple station and observing, forecasting and, finally, the concept of climatology are set forth in separate chapters. Sample forms, useful conversion and other tables and illustrations of the main instruments and most interesting phenomena and a list of 6 recent Russian texts and 21 popular science books on meteorology are included. *Subject Headings:* 1. **Meteorology textbooks** 2. **Amateur observers manuals** 3. **Teaching of meteorology in high schools.**—*M.R.*

7.2-7

551.5:63

Daigo, Yoshiyasu, **Nogyo to Kisho.** [Agriculture and weather.] rev. ed. Tokyo, Asakura Book Co., Ltd., 1950. 248 p. 66 figs., numerous tables, refs. In Japanese. **DLC**—A popular treatise on agrometeorology with chapters as follows: 1) Introduction, 2) Crops and weather, 3) Soil and weather, 4) Fertilizer and weather, 5) Crop diseases and weather, 6) Crop damage from insects and vermin and weather, 7) Meteorological damage caused by some abnormal weather conditions, 8) Forestry and weather, 9) Domestic animals and weather, 10) Sericulture and weather, 11) Fisheries and weather, 12) Agricultural economy and life, 13) Weather forecasting and its application and 14) Appendix. *Subject Headings:* 1. **Agricultural meteorology** 2. **Weather forecasting.**—*H. Arakawa.*

7.2-8

551.584.43 (02):551.58:581

†Klika, J.; Novák, V. and Gregor, A. (eds.), **Praktikum fytoecologie, ekologie, klimatologie a půdoznalství.** [Practical plant sociology, ecology, climatology and soil science.] Prague, Československá Akademie Ved, 1954. 773 p. 220 figs., tables, bibliogs. throughout. **DLC**—Also review: Krečmer, Vladimír, **Cenná pomůcka pro bioklimatologické práce.** [A valuable aid in bioclimatological work.] *Meteorologické Zprávy*, Prague, 8(2):52-53, April 30, 1955. **DWB**—This textbook on plant sociology and related sciences contains a substantial section on climatology (p. 139-376) which may, in itself, be regarded as a textbook on climate in relation to plant life. This section was contributed by ten authors who wrote the different chapters on solar radiation, its light and energy supply, humidity, atmospheric carbon dioxide,

evaporation, dew, precipitation, wind, soil moisture and intensity of photosynthesis. The emphasis on instruments and methods of measurement throughout these chapters makes the book especially valuable as a guide to microclimatological observation and research. References (especially to German, Russian and Czech literature) are given at the end of each chapter. The book has been commended by the Ministry of Education of Czechoslovakia. *Subject Headings: 1. Plant climatology 2. Textbooks.—G.T.*

## MONOGRAPHS

7.2-9

551.510.53:551.508.95

\*Elterman, L., Seasonal trends of temperature, density, and pressure in the stratosphere obtained with the searchlight-probing technique. *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 29, July 1954. 70 p. 34 figs. (incl. photos), 23 tables, 12 refs., eqs. **DWB, DLC**—Light-scattering measurements from a searchlight beam were carried out in the vicinity of Albuquerque, New Mexico, during the period 29 May through 23 Oct. 1952. Data were acquired on distributions of density, temperature, and pressure to an altitude of 67.6 km. The density information was obtained by formulating an expression based on the following: Rayleigh scattering, searchlight geometry, attenuation in the atmosphere, and the characteristics of the instrumentation. From the density distributions obtained, corresponding temperature profiles were derived. The density-temperature equation required the evaluation of an integration constant, which was accomplished by using radiosonde information and physically acceptable temperature lapse rates. With the densities and temperatures established, the pressure distribution was obtained from application of the gas equation of state. Ninety sets of measurements were obtained during 18 nights when the sky was clear and moonless. Density distributions and temperature profiles are presented for each night. Monthly averages were calculated so that the presence of seasonal trends could be determined. An overall representation of stratosphere conditions over New Mexico, based on the average of the 90 sets of measurements, is submitted. *Subject Headings: 1. Air density 2. Searchlight technique 3. Stratospheric temperatures 4. Stratospheric pressure 5. Stratosphere 6. Albuquerque, N. M.—Author's abstract.*

7.2-10

551.5

Clausse, Roger, *L'atmosphère, domaine de la météorologie, Pt. 1, Historique et généralités.* [The atmosphere, domain of meteorology, Pt. 1, Historical and general.] *La Nature*, Paris, No. 3218:181-185, June 1953. 6 figs. (incl. photos). Pt. 2, *Variations des facteurs météorologiques suivant la verticale.* [Vertical variation of meteorological factors.] *Ibid.*, No. 3219:203-207, July 1953. 8 figs. (incl. photos), table. Pt. 3, *Variations horizontales des facteurs météorologiques.* [Horizontal variations of meteorological factors.] *Ibid.*, No. 3220:247-252, Aug. 1953. 7 figs. Pt. 4, *L'atmosphère dans sa complexité réelle.* [The atmosphere in its actual complexity.] *Ibid.*, No. 3221:268-271, Sept. 1953. 8 figs. Pt. 5, *La prévision du temps.* [Weather forecasting.] *Ibid.*, No. 3222:303-308, Oct. 1953. 12 figs. (incl. photos). **DLC**—A series of 5 articles forming a general but complete survey of the basic principles of atmospheric physics, synoptic meteorology and practical meteorology (weather service), with illustrations of activities, equipment, charts, etc. used in the French weather service. A synoptic (isobaric) chart for May 23, 1866 shows the network existing in Europe at the time LE VERRIER issued his first synoptic charts. Soundings made by TEISERENC DE BORT at Trappes, present day radiosonde balloon inflation, release and equipment, 300 mb chart for most of the Northern Hemisphere, fronts, cloud systems, ocean weather network, analysis center activities, briefing of pilots, information display for public, etc., are among activities described and illustrated. *Subject Headings: 1. General meteorology 2. Practical meteorology 3. France.—M.R.*

7.2-11

551.506:551.573:551.481.1

\*U. S. Geological Survey and U. S. Weather Bureau. *Water-loss investigations. Lake Hefner studies, Base data report.* *U. S. Geological Survey, Geological Survey Professional Paper*, No. 270, 1954. 300 p. almost entirely tables. "Part of the edition issued as U. S. Navy Electronics Laboratory, N.E.L. Report, No. 328." **DWB**—This report, which is the second of two reports on the Lake Hefner project, contains observations necessary to determine

evaporation from Lake Hefner for the water-budget, mass transfer, energy budget, and pan-evaporation methods. The tables contain averages of the field observations. Daily values are presented for each of the items required for evaporation by using the water budget method. Three-hour and daily averages of the mass transfer state are presented. Wet and dry bulb temperatures and wind speeds at four levels plus water surface temperatures are given for each of the four meteorological stations. Daily means of the various radiation items of the energy budget are presented. Also "temperatures measured in connection with the operation of the Cummings radiation integrator for each of the periods between CRI servicings" are given. Brief descriptions of the data are presented. (For **Lake Hefner Studies, Technical Report**, pub. 1952; see 5.3-13, March 1954, *MAB*.) *Subject Headings*: 1. Evaporation 2. Energy budget 3. Lake Hefner, Okla. I. U. S. Navy Electronics Laboratory II. U. S. Bureau of Reclamation.—*I.L.D.*

7.2-12

551.582:551.579 (058) (45)

\*Italy. Istituto Idrografico, Genova, *Annali idrologici*, 1945 [and] 1950. [Hydrologic Yearbook, 1949 and 1950.] both pub. Rome, 1955. 2 pieces. about 75 p. each. charts, figs. almost entirely tables. At head of t-p: Servizio Idrografico. Sezione Autonoma del Genio Civile con sede in Genova per i Bacini con foce al Litorale Tirrenico dal Roia al Magra. **DWB**—Hydrologic annuals for the coast of Gulf of Genoa similar to those published for other regions of Italy (see 7.1-302 and 7.1-303, Jan. 1956, *MAB*). Contains daily maximum and minimum temperatures, mean and extreme monthly temperatures, daily and extreme intensity of precipitation, number of days with precipitation and snowfall, runoff data, and annual summary, with large and small charts and graphs, of all hydrometeorological elements. Stations range in height from sea level to 1035 m. *Subject Headings*: 1. Hydrologic yearbooks 2. Annual meteorological reports 3. NW Italy.—*M.R.*

7.2-13

551.556:621.311.24 551.552

\*Karmishin, A. V., *Veter i vetrodvigatel'*. [Wind and wind motor.] Moscow, Goskul'tprosvetizdat., 1952. 76 p. 35 figs., table, 10 refs. **DLC**—This popular bulletin (50,000 copies issued) gives the important facts about the history of the use of wind power and, in particular, of windmills (in Europe since 8th century), the characteristics of wind (elementary principles of atmospheric circulation, anticyclone and cyclonic and local winds, measurement of wind speed, etc.), modern windmills for water and electric power, methods of dealing with capriciousness of the wind (such as squalls or destructive gales), wind power accumulation to tide over calm periods, use of wind in agriculture and industry, wind distribution throughout the Soviet Union (where wind power may be used most effectively) and, finally, average monthly and annual wind speed at 30 stations in European and Asiatic U.S.S.R. The bulletin has numerous illustrations of wind mills and wind power machines, including a 100 kw, a 1000 kw and a rotor type mill for electric power generation. *Subject Headings*: 1. Wind generators 2. Wind distribution 3. Windmills 4. Wind speed data 5. U.S.S.R.—*M.R.*

7.2-14

551.55 (02)

Zavarina, M. V., *Veter*. [Wind.] Leningrad, Gidrometizdat., 1951. 60 p. 27 figs. **DLC**—A short monograph on wind, covering the following aspects: source or cause of winds, theoretical forces involved, cyclones and anticyclones, surface and upper air wind, instruments and measuring equipment, eddies, tropical hurricanes, waterspouts and tornadoes, local winds, hot dry winds, desert winds, shelter belts with respect to wind, winds in the stratosphere, the effects of wind and use of wind for power or work. *Subject Headings*: 1. Winds 2. Wind measurement 3. Wind effects 4. Textbooks.—*M.R.*

## GENERAL GEOPHYSICS AND METEOROLOGY

### ORGANIZATIONS

7.2-15

551.46

International Union of Geodesy and Geophysics. Association of Physical Oceanography, Rome, 1954, *Report of Committee on the Geophysical Year 1957-58*. G. E. R. Deacon,

Secretary. Its *Procès-Verbaux*, pub. Bergen, 1954. p. 102-104. DWB—Contains recommendations concerning: 1) Observations of the existence, generation and propagation of long period, nontidal, oscillations of sea level; 2) Studies of water circulation in the equatorial region along two north-south lines and a number of short lines, measurements of actual water velocities and heat exchange between sea and air; 3) Studies of processes involved in the shifting of the boundary regions between temperate and Arctic waters; 4) Studies of the CO<sub>2</sub> balance between the atmosphere and oceans; 5) Measurement with ocean cables of electric "earth" currents flowing in the sea; 6) Assistance in oceanic circulation studies by ocean weather ships (regular bathymetric observations); 7) Help that should be provided by oceanographers (placing recording stations on islands) to the Association of Seismology in setting-up seismic recording apparatus. *Subject Headings*: 1. International Geophysical Year program 2. Physical oceanography.—A.M.P.

7.2-16

91.04(99)

Byrd, Richard E., *Why we're going back to the South Pole*. *American Weekly Magazine*, [Washington Post-Times Herald], July 24, 1955, p. 10-14. photo. DLC—A highly readable account of the various U. S. expeditions to the Antarctic under the auspices of the U. S. Navy and under the direction of the author, and details of the coming IGY effort which will be the most comprehensive polar exploration program ever attempted. Thirty-five countries will participate. Large scale operations by the U. S. Navy will precede the actual 1957-58 effort. Leaders of various phases of the IGY are named, and types of research, location of stations, etc. outlined. This will be BYRD's fifth expedition to Antarctica. In addition to history of Antarctic discovery and exploration, he explains his own motives—mainly to find out what is "around the next corner." The Antarctic is the principal remaining unexplored part of the earth's surface. *Subject Headings*: 1. Antarctic expeditions 2. International Geophysical Year, 1957-58 3. Antarctica.—M.R.

7.2-17

551.5:550.3:06

Lango, K., I.U.G.G. General Assembly at Rome. *World Meteorological Organization, WMO Bulletin*, 4(2):76-79, April 1955. DWB—A report on the program and activities of the 10th General Assembly of the I.U.G.G., Rome, Sept. 14-25, 1954 and attended by about 1,000 persons from 40 countries. Some of the lectures and scientific discussions were arranged in 10 symposia, 4 of which were held jointly with other associations. Such problems as storm surges, precipitation and meridional large-scale phenomena were discussed from different viewpoints. Other important problems were: the future of weather forecasting, atmospheric ozone, general circulation in the atmosphere and the chemistry of precipitation. The role played by WMO in the future development of meteorology and administrative questions is also discussed. Scientific papers read at the meeting will appear in IAM publications. *Subject Headings*: 1. I.U.G.G. meeting, Rome, 1954 2. Symposia.—A.M.P.

7.2-18

550.3:06

Silich, M. V. and Buz, A. I., *Tret'ia nauchnaia konferentsiia geofizikov Litovskoi SSR*. [Third Scientific Conference of Geophysics of the Lithuanian S.S.R.] *Meteorologija i Hidrologija*, Leningrad, No. 1:66, Jan./Feb. 1955. DWB—This conference, held in Vilno in May 1954, was organized by the Institute of Geology and Geography of the Lithuanian Academy of Sciences. The names of the chairmen of the various sections and the titles of some of the papers delivered are listed. *Subject Headings*: 1. Geophysical conferences 2. Vilno, Lithuania.—I.L.D.

7.2-19

551.590.21:523.7:061

†International Council of Scientific Unions, Brussels, *Eighth Report of the Commission for the Study of Solar and Terrestrial Relationships*. Paris, J. & R. Sennac, 1954. 184 p. figs., tables, numerous refs., eqs. Title-page in French. Text in French or English. DWB—The papers in this Report deal mainly with solar physics and solar radiations. M. NICOLET discusses the light of the night sky and auroras, and J. PATON, the observation of aurora. The papers are abstracted separately. The section on solar and terrestrial relations is omitted. *Subject Heading*: 1. Commission for Study of Solar and Terrestrial Relations.—C.E.P.B.

7.2-20

551.590.21:523.7:06

d'Azambuja, L., **Introduction [to 8th Report]** *International Council of Scientific Unions Brussels, Eighth Report of the Commission for the Study of Solar and Terrestrial Relationships* Paris, 1954. p. V-VII. **DWB**—Reports the deaths of BERNARD LYOT and J. DAUDIN. Changes in the Commission are listed and the work of the Commission at Rome, Sept. 1953 summarized. *Subject Headings*: 1. Commission for Study of Solar and Terrestrial Relations—C.E.P.B.

7.2-21

551.5:061.1

Durward, J., **Second Congress of the World Meteorological Organization.** *Meteorological Magazine*, London, 84(999):265-267, Sept. 1955. Also his: **Conference of Commonwealth Meteorologists, May 1955.** *Ibid.*, p. 267-271. **DWB**—The first paper describes the Congress at Geneva, April 14-May 13, 1955. The officers are listed and the work of the Legal, Administrative and Program Committees summarized. In the second paper, DURWARD describes the Conference in London, May 23-26, Chairman, J. M. STAGG. Discussions on marine meteorology, recruitment and training, meteorology and aviation, gusts and turbulences, numerical forecasting, research, forecasting and Geophysical Year are described. *Subject Headings*: 1. World Meteorological Organization 2. Commonwealth Meteorological Conference 3. Conferences.—C.E.P.B.

7.2-22

551.5:06(09)

Van Mieghem, J., **De noodzakelijkheid van een internationale organisatie voor de meteorologie.** [Necessity for an international meteorological organization.] *Hemel en Dampkring*, The Hague, 53(3):57-62, March 1955. 2 figs. **MH-BH**—An historical account of the development of international cooperation in meteorology from the first meteorological congress held in Brussels in 1853, under the chairmanship of ADOLPHE QUETELET, to the establishment of the WMO. *Subject Headings*: 1. History of international meteorological organizations 2. World Meteorological Organization.—I.L.D.

## EXPEDITIONS

See also: **Why we're going back to the South Pole** (Byrd), 7.2-16.

7.2-23

91.04:551.311.173(98)

Mikkelsen, Ejnar, **Ukendt mand til ukendt land.** [An unknown man to unknown land.] Copenhagen, Gyldendal, 1954. 191 p. photos, map, ports. **DLC**—Author failed to discover the "unknown land" in the Beaufort Sea during his expedition on the "Duchess of Bedford" in 1906-1907. A popular account of experiences during this time and until COL. J. O. FLETCHER discovered an ice-island (T 1) in Aug. 1946 is presented. The paleocryptic ice found by author in 1906 was a fragment of an ice-island and confirms his theory of "land" in this region. *Subject Headings*: 1. Arctic expeditions 2. Arctic ice islands 3. Beaufort Sea.—W.N.

7.2-24

551.506.5:551.311.12(987)

§†Orvig, Svenn (*Dir. Montreal Off., Arctic Inst. of North America*), **Glacial-meteorological observations on icecaps in Baffin Island.** *Geografiska Annaler*, Stockholm, 36(3/4):197-318, 1954. 44 figs. (incl. photos.), 14 tables, numerous foot-refs., bibliog. p. 312-318, eqs. **DLC**—A major monograph presenting results of observation on the Baffin ice caps in May-Sept. 1953 by the Second Baffin Island Expedition. The first Baffin Island Expedition in 1950 measured glacio-meteorological conditions at edge of Barnes Ice Cap, and the second expedition on Cumberland Peninsula. The icecap station at 6725 ft was operating May 21 to Aug. 9, with bi-hourly observations from 0800 to 2000 h of pressure, temperature at 3, 13 and 23 ft height, humidity at 3 ft, wind speed at 6 ft, clouds, fog, visibility and ceiling. Maximum and minimum temperatures and precipitation at 08, 14 and 20 h, snowfall, rain, and sunshine were also measured. Continuous recordings of pressure, temperature and humidity and incoming short wave radiation were made for 80 days. Spot measurements of net radiative flux and of incoming and outgoing short wave radiation were made occasionally with special radiometers.

Data for May-Aug. 1953 for Padloping Island, 80 mi ENE and for period 1944-53 and summary of weather in Cumberland Peninsula during summer of 1953 is followed by description of meteorological observations on Penny Ice Cap, accompanied by samples of recorder records, compiled graphs and curves, illustration of equipment, frequency distributions, synoptic charts for North America illustrating frontal passages during summer of 1953. Radiation, sunshine and albedo are discussed in Ch. IV, ablation in Ch. V, and heat exchange in Ch. VI. Finally, a comparison is made between ablation factors calculated on 10 expeditions from 1931 to 1953 on different glaciers. Radiation, convection and conduction, and condensation factors in ablation show wide variation in percentages at these places. Of course surfaces vary from snow to ice and elevations from 5 m to 3000 m, while latitude varies from 46° N to 80° N. An extensive bibliography is appended. *Subject Headings:* 1. Baffin Island Expedition, Second, 1953 2. Glacier-meteorological observations 3. Ablation factors 4. Albedo of glaciers 5. Penny Ice Cap, Baffin Island 6. Padloping Island, Canada.—*M.R.*

7.2-25

91.04(988)

Simpson, C. J. W., *The British North Greenland expedition*. *Geographical Journal*, London, 121(3):274-289, Sept. 1955. 2 figs., 6 photos. DWB—The story of the expedition of 1952-54 to Dronning Louises Land. A large deep lake on the ice was used as a base camp reached by air lift. Brief descriptions are given of the geological, geophysical, gravity, glaciological and seismic work. A pit in the snow 50 ft deep showed annual layers back to 1877, equivalent to about 5" rain until the 1920's, decreasing by 2" by 1940. Britannia glacier is getting smaller. *Subject Headings:* 1. Arctic expeditions 2. British Greenland Expedition 1952 3. North Greenland.—*C.E.P.B.*

7.2-26

551.501.9:551.43

Beiser, Arthur, *Mt. Wrangell expedition*. *Physics Today*, 6(10):10-14, Oct. 1953. illus. DLC—Narrative account of a joint expedition sponsored by New York U. and U. of Alaska. The expedition established a high-altitude laboratory (for cosmic ray research, meteorology, biology and vulcanology). Weather features on Mt. Wrangell are briefly referred to. Photographs showing details of construction and equipment are presented. *Subject Headings:* 1. Mountain observatories 2. Arctic weather stations 3. Mt. Wrangell Observatory, Alaska.—*G.T.*

7.2-27

551.506.5(269)

\*Kirpichnikov, A. A., *U beregov Antarktiki*. [The shores of the Antarctic.] *Priroda*, Moscow, 43(10):71-78, Oct. 1954. illus. DLC—The description of the Antarctic Ocean is based upon the experiences of a whaling ship "Slava" in March and April 1948. Weather conditions are described and isolated data on air and water temperatures and wind velocity are given. A map showing the course of the "Slava" and photographs of the ship and of whaling activities are presented. *Subject Headings:* 1. Marine meteorological data 2. Whaling expeditions 3. Antarctic Oceans.—*I.L.D.*

## SERVICES

See also: WMO 2nd Congress (Durward), 7.2-21; British Meteorological Off. (Gold), 7.2-41; History of British Meteorological Off. (Bull), 7.2-46; Contract weather stations (Benes), 7.2-77.

7.2-28

551.5:061.1(04)

Great Britain. Meteorological Office, *Your weather service: the Meteorological Office and how it can help you*. London, 1955. rev. ed. *M.O.M.* 550. 52 p. 4 figs., 8 plates. Price: 1s/6d. GB-MO—A popular account of the British Meteorological Office on the occasion of its centenary. Chapters: How a modern forecasting service works; Public and personal services (forecasts for B.B.C., press, aviation, shipping; gale and frost warnings, etc.); How to interpret weather forecasts; The treasury of weather records. Appendices describe B.B.C. sound and television forecasts, press reports, information by telegram and telephone, meanings

of words in weather forecasts, monthly temperatures for 26 districts and climatic table for Kew Observatory. *Subject Heading: 1. British Meteorological Service.—C.E.P.B.*

7.2-29

551.5:061(829)

**Falkland Islands and Dependencies Meteorological Service.** *Polar Record*, 7(51):521-522, Sept. 1955. **DLC**—Summaries of Annual Reports for 1950 to 1953. The history and functions of the Service are given. *Subject Headings: 1. Falkland Islands and Dependencies Meteorological Service 2. Meteorological services.—C.E.P.B.*

7.2-30

551.5:06(43)

**Meteorological activities in Germany 1945-1953.** *I.U.G.G. Bulletin d'Information*, 3(6):208-214, July 1954. **DWB**—The 11 main university research institutes in West Germany, the Max-Planck Institute for Physics of the Stratosphere at Weissenau, the Long Range Weather Forecast Institute at Bad Hamburg, and the various meteorological services in the different zones, the observatories, etc., now combined into one service, are described with respect to directorships since 1945, publications, and chief lines of research. No bibliographies are given since more "detailed information will be found in current publications as, e.g., *Meteorologische Rundschau*, *Meteorological Abstracts* and *Bibliography*, etc." *Subject Heading: 1. German Federal Meteorological Service.—M.R.*

## BIOGRAPHY, EDUCATION AND HISTORY

### BIOGRAPHY

7.2-31

551.5:92

**Flohn, Hermann, Willy Hellpach.** [Obituary.] *Meteorologische Rundschau*, 8(5/6):73, May/June 1955. **MH-BH**—Born 26.2.1877 in Oels, Silesia, died 6.7.1955 in Heidelberg. Psychologist and State President. Many-sided, his best-known book, *Geopsyche*, deals with the influence of weather, climate, soil and landscape on the human mind. It first appeared in 1911; 6th ed. 1952. *Subject Headings: 1. Obituaries 2. Hellpach, Willy.—C.E.P.B.*

7.2-32

551.5:92

**Botley, Cecily M., Parry of the Parry arc.** *Weather*, 10(10):343-345, Oct. 1955. fig., 7 refs. **DWB**—Brief biographies of **CALEB HILLIER PARRY** (1755-1822) and his son, **WILLIAM EDWARD PARRY** (1790-1855). The latter made kite soundings to 400 ft (1822-23), measured velocity of sound (1821-22) and discovered Parry arc (1820). *Subject Headings: 1. Biography 2. Parry, C. H. 3. Parry, W. E.—C.E.P.B.*

7.2-33

551.5:92

**Weickmann, Ludwig Friedrich, Professor Dr. Max Robitzsch.** [Obituary.] *Meteorologische Rundschau*, 5(7/8):121, July/Aug. 1952. **DWB**—**DR. ROBITZSCH**, Professor of Geophysics and Director of the Geophysical Institute of Leipzig, died suddenly June 10, 1952. A brief account of his work is given. *Subject Headings: 1. Obituaries 2. Robitzsch, Max.—C.E.P.B.*

7.2-34

551.5:92

**Babushkin, L. N., Professor A. A. Skvortsov.** [Obituary.] *Meteorologiya i Gidrologiya*, No. 2:65-66, March/April, 1955. **DLC**—**PROF. SKVORTSOV**, a leading agricultural meteorologist of the Uzbek, S.S.R., died Sept. 19, 1954 at the age of 55. An account of his scientific contribution and his photograph are presented. *Subject Headings: 1. Obituaries 2. Skvortsov, A. A.—I.L.D.*

7.2-35

551.5:92

**Dr. R. C. Sutcliffe, O. B. E.** *Weather*, 10(10):347-348, Oct. 1955. port. **DWB**—**Biography of Reginald Cockcroft Sutcliffe**, this year's President of Royal Meteorological Society, born 1904. Research in development of synoptic situations. Assistant Director,

Forecasting Research, 1946; Deputy Director (Research) 1953. *Subject Headings: 1. Biography*  
**2. Sutcliffe, Reginald Cockcroft.—C.E.P.B.**

## BIBLIOGRAPHY AND EDUCATION

See also: **Contract weather stations** (Benes), 7.2-77; special bibliography on **Climate of Enclosed Spaces**, p. 211.

7.2-36

551.586:63:016

†Germany. Deutscher Wetterdienst, **Agrarmeteorologischer Literaturbericht**. [Agrometeorological literature review.] No. 1, May 1954—Latest issue seen, Vol. 2, No. 1, July 1955. About 25 p. per issue. Mimeo. Compiled in the Agro-meteorological Division of the Central Office. Each issue an annotated bibliography on a different subject. Also its: **Agrarmeteorologischer Literaturbericht, Inhaltsverzeichnis, Band 1, Nr. 1-6, 1954/1955**. [Agrometeorological literature review, Index to Vol. 1, No. 1-6, 1954/1955.] 9 p. Mimeo. DWB—The present series is a continuation of the publication issued by the Hamburg office of the N.W. German Weather Service prior to the reorganization of the services. Long reviews of agrometeorological works from all over the world are presented in organized form. No. 1 reviews recent literature on wind power and windbreaks; No. 2, soil moisture and evaporation from the soil and No. 3, potato blight outbreaks. Since Vol. 1, No. 1-6, did not contain any index or paging, the 100 items were listed alphabetically by author in this supplementary index. Most of the articles listed are long informative reviews or condensations of articles from every country. *Subject Headings: 1. Annotated bibliographies 2. Agricultural meteorology 3. Agricultural meteorology reviews 4. Wind power 5. Windbreaks 6. Potato blight 7. Soil moisture.—M.R.*

7.2-37

535.33:778.6

Hodge, Edwin S. (Mellon Inst., Pittsburgh), **Recording of visible spectrum on color film**. *Optical Society of America, Journal*, 45(1):64-65, Jan. 1955. DWB—Article explains briefly how color spectra for projection or display purposes in teaching or laboratory can be recorded on Kodachrome or Ansco color film and mounted for use on slides. *Subject Heading: 1. Color photography of spectra.—M.R.*

7.2-38

778.5

Rieck, Joachim, **Die Verfahren der Kinematographie in Wissenschaft und Technik**. [The method of cinematography in science and technology.] *Naturwissenschaftliche Rundschau*, 8(10):388-397, Oct. 1955. 20 figs. DWB—Examples of scientific cinematography include time-lapse photos of cumulus. Special apparatus for infrared, time-lapse and ultra-rapid (1000 exposures/sec) cinematography is illustrated. *Subject Heading: 1. Cinematography applications.—C.E.P.B.*

7.2-39

551.5(05)

Baum, Werner A. (Dept. of Met., Florida St. Univ., Tallahassee), **Editorial policies of the Journal of Meteorology**. *American Meteorological Society, Bulletin*, 36(4):179-180, April 1955. DWB—A statement of editorial policies of the **Journal of Meteorology** relating to the type of material published and the handling of the submitted contributions. *Subject Heading: 1. Journal of Meteorology.—I.L.D.*

7.2-40

5:65

Solow, Herbert, **Science for sale—at a profit**. *Fortune*, N. Y., March 1955. p. 104-108, 136, 141-144. photos. Abstracted from excerpted sheets. DWB—Description of activities of Arthur D. Little, Inc., Cambridge, Mass., which has pioneered (since 1886) in doing research for a profit, on contract with industrial firms. Research, which ranges between pure-pure and pure-applied science, is done by a staff of 800, the majority with degrees (35 with doctorates). Types of work done, teamwork principle, sales and managerial opportunity for scientists are reviewed. *Subject Headings: 1. Opportunities in science 2. Scientific research 3. Little, Arthur D., Inc.—M.R.*

## HISTORY

See also: Weather forecasting development (Flohn), 7.2-99.

7.2-41

551.5:061(41)

Gold, E., Editorial [on British Meteorological Office]. *Weather*, 10(6):176-178, June 1955. Also: Veryard, R. G., History and constitution of the Meteorological Office. *Ibid.*, 178-182. DWB—GOLD gives a chatty account of outstanding position of British Meteorological Office and its possible future as a "hydrometeorological service." VERYARD briefly summarizes its history and gives the present constitution of the advisory Meteorological Committee and the organization of the Meteorological Research Committee and the Meteorological Office. *Subject Heading: 1. British Meteorological Service.—C.E.P.B.*

7.2-42

551.5:061.1:623

Stagg, J. M., The Meteorological Office and the Second World War. *Meteorological Magazine*, London, 84(996):178-183, June 1955. DWB—Rapid survey of the work of observing and forecasting in all theaters of war, including developments in upper air. *Subject Heading: 1. Meteorology in war.—C.E.P.B.*

7.2-43

551.5:061.1(41)(09)

Sutton, Sir Oliver Graham, The Meteorological Office, 1855-1955. *Nature*, London, 175(4466):963-965, June 4, 1955. DWB—Account by the new Director of the history of the British Meteorological Office from its foundation as Meteorological Department of Board of Trade, in 1855, and present organization. *Subject Headings: 1. History of British Meteorological Office 2. British Meteorological Service.—C.E.P.B.*

7.2-44

551.5:061.1:623

Gold, E., The Meteorological Office and the First World War. *Meteorological Magazine*, London, 84(996):173-178, June 1955. DWB—Account of development of "The Meteorological Section of the Royal Engineers" in 1915, winds for gas warfare, upper air observations, visibility, and a new code, subsequently adopted by the I.M.O. *Subject Heading: 1. Meteorology in war.—C.E.P.B.*

7.2-45

551.5:061.1(41):061.3(09)

Gold, E., The Meteorological Office and the International Organization. *Meteorological Magazine*, London, 84(996):196-198, June 1955. DWB—History of the large part played by British meteorologists since the conference at Brussels in 1853, out of which the Meteorological Office was born, to the Washington Conference in 1947, which was piloted through all difficulties by the President, Sir Nelson Johnson. *Subject Heading: 1. International Meteorological Organization.—C.E.P.B.*

7.2-46

551.5:061.1(09)(41)

Bull, G. A., Short history of the Meteorological Office. *Meteorological Magazine*, London, 83(996):163-167, June 1955. 7 photos. DWB—Account of the development of the British Meteorological Service from its foundation early in 1855 as the Meteorological Department of the Board of Trade to its present development as a department of the Air Ministry with a staff of about 3000. Photos are given of FITZROY, SCOTT, SHAW, LYONS, SIMPSON, JOHNSON and SUTTON. *Subject Headings: 1. History of British Meteorological Office 2. British Meteorological Service.—C.E.P.B.*

7.2-47

551.5(09)(43)

Keil, Karl, Zur Geschichte der Meteorologie in Deutschland. [On the history of meteorology in Germany.] *Meteorologische Rundschau*, 8(5/6):94-97, May/June 1955. table, 12 refs. DWB—Traces history since 14th century. Mainly calendars at first. Instrumental observations in Germany began in 1678 and grew slowly in 18th and early 19th centuries. The dates of founding of the various services since Prussian Meteorological Institute (1847) are tabulated. *Subject Headings: 1. History of meteorology 2. Germany.—C.E.P.B.*

## PRACTICAL AND APPLIED METEOROLOGY

## MARINE METEOROLOGY AND OCEANOGRAPHY

See also: **Physical oceanography** (I.U.G.G.), 7.2-15; **Antarctic shores** (Kirpichnikov), 7.2-27; **Marine meteorological services** (Seilkopf), 7.2-96.

7.2-48

551.507.2:551.556:551.46:532.59

Darbyshire, J., **An investigation of storm waves in the North Atlantic Ocean.** *Royal Society of London, Proceedings, Ser. A*, 230(1183): 560-569, July 12, 1955. 7 figs., 14 refs., 8 eqs. DWB—Records with a wave recorder on the "Weather Explorer" in the North Atlantic were analyzed by a Fourier analyzer. The maximum period and period of maximum amplitude increased with the square root of the gradient wind speed, the height with the square of the gradient wind. The effect of fetch increased up to 100 mi and then reached equilibrium. Results are compared with those for Perranporth, Cornwall. In deep water, wave heights are greater and periods shorter. The differences are attributed to greater effect of turbulence near the coast, where the water is shallow and short period waves lose energy faster. *Subject Headings*: 1. Wave height data 2. Wave period data 3. North Atlantic 4. Perranporth, England.—C.E.P.B.

7.2-49

551.5(261.2):061

P[eters], S. P., **Netherlands Conference on meteorological problems of the North Sea.** *Marine Observer*, 25(169):159-160, July 1955. MH-BH—An informal meeting at De Bilt, Feb. 7-8, 1955, discussed ship reports from North Sea, radio storm-warning services, and possible improvement of network by a fixed observing post near middle of North Sea. *Subject Headings*: 1. Marine meteorological conferences 2. North Sea.—C.E.P.B.

7.2-50

551.556(26)

Francis, J. R. D., **Wind stress on the sea.** *Journal of Meteorology*, 12(2):190, April 1955. ref., eq. DWB—G. H. KEULEGAN's division of wind stress into a smooth surface and rough surface component (see item 3.10-192, Oct. 1952, MAB) is criticized. The cube law is favored instead. *Subject Heading*: 1. Wind stress.—C.E.P.B.

7.2-51

551.556:532.59(26)

\*Brown, P. R., **Wave heights and periods at Ocean Weather Stations India and Juliett, 1949-53.** *Marine Observer*, 25(16):163-166, July 1955. 4 tables, 3 refs. DWB—Frequencies of wave heights and periods are tabulated monthly for I (59°-61°N, 15°20'-20°W) and J (52°30'-53°50'N, 18°40'-20°W). *Subject Headings*: 1. Wave height data 2. Wave period data 3. Ocean weather station data.—C.E.P.B.

7.2-52

551.507.2:551.46

Mosby, Håkon, **Oceanographical investigations at Weather Ship Station M (66°N, 2°E).** *Bergen. Universitetet, Arbok*, 1953, *Naturvitenskapelig Rekke*, No. 10, pub. Feb. 1954. 8 p. 2 photos, 2 tables. DWB—An illustrated pamphlet describing the history, personnel, equipment, finances and operations of the oceanographic work at Weather Ship Station "M" from 1947-54. Annual budget, work in marine biology and physical oceanography, including equipment, stations, drift bottle release (11 series of 5 bottles each month), radiation and light penetration measurements, wind drift, pollen grain, plankton, surface temperature measurements, etc. reviewed. Bottom topographic map in area was developed by echo-soundings. Bad weather reduced planned program very little. Routine shore analysis of data made at a well equipped laboratory at the Geophysical Institute at Bergen. *Subject Headings*: 1. Oceanographic research on weather ships 2. Norwegian oceanographic research 3. Weather Ship "M" 4. Atlantic Ocean.—M.R.

7.2-53

551.556:551.46.018

Barber, N. F., **Finding the direction of travel of sea waves.** *Nature*, London, 174(4440): 1048-1050, Dec. 4, 1954. 2 figs., 3 refs., 2 eqs. DWB—An electrical wave height detector

is described. Two such instruments in Waitemata Harbor, Auckland, N. Z., were used to obtain wave heights at distances of 2-27 ft. It was found that the highest waves travelled in the direction of the wind. *Subject Headings: 1. Ocean wave measurement 2. Waitemata Harbor, Auckland, N. Z.—C.E.P.B.*

7.2-54

551.556:551.46

Walden, Hans, *Dünung und Windstau*. [Swell and wind pressure.] *Deutsche Hydrographische Zeitschrift*, 7(3/4):139-140, 1954. 4 refs., eqs. English and French summaries p. 140. DWB—The effect of a local coast wind on a swell running parallel to the wind is examined with special reference to Nov. 7, 1953 on the German coast. "Owing to the high speed of long swell the wind's tangential shearing strain on the water masses may become less effective than it would do if no coincidence with swell waves occurred." *Subject Headings: 1. Wind effects on water surfaces 2. German Coast.—C.E.P.B.*

7.2-55

551.46

Bowden, K. F., *Deep-water movements in the ocean*. *Nature*, London, 175 (4444):24-26 Jan. 1, 1955. DWB—Summary of a Geophysical Discussion at R. Astronomical Society on Oct. 22, 1954. Methods of measuring deep-water currents, and theoretical and experimental studies, are described, including currents due directly or indirectly to wind stress on the sea surface. *Subject Heading: 1. Ocean currents.—C.E.P.B.*

7.2-56

551.465:532.59

SHuleikin, V. V., *Vykhod zybi iz shtormovoi zony na glubokom more*. [The origin of swell from the storm zone in deep seas.] *Akademiia Nauk SSSR, Doklady*, 99(1):57-60 Nov. 1, 1954. fig., 4 refs., 19 eqs. DLC—This theoretical study of the swell outside the storm zone, limited to the case when the waves begin to spread in the calm zone, is based upon the fundamental assumptions used in deriving the equation of the wave field developing from the windward to the lee shore when the wind field is uniform over the entire sea (see item 6.8-262, Aug. 1955, MAB). The dying out of short waves outside of the storm zone and the appearance of swell with extremely large periods along the shores of some seas is explained. *Subject Headings: 1. Ocean swell 2. Deep water wave theory 3. Wind waves.—I.L.D.*

7.2-57

551.46.018

Tucker, M. J. (*British Nat. Inst. of Ocean.*), *Shipborne wave recorder*. *I.U.G.G. Association of Physical Oceanography, Rome, Sept. 14-25, 1954, Procès-Verbaux*. Bergen, 1954 p. 245. DWB—The construction and operation of a wave recorder incorporated in the ship's hull, and not requiring buoys and wires which are difficult to handle in bad weather, are described. The wave recorder consists of a measuring head which measures the height of waves above the hole in the ship's hull in which it is fixed by its response to the water pressure. The doubly integrated output of an accelerometer mounted in the same position measures the vertical displacement of the pressure recorder above an arbitrary reference level, and the output of the pressure recorder and integrated accelerometer, added together, give a reliable wave record. The recorder has been used on "Discovery II" and on the ocean weather ship "Weather Explorer." *Subject Headings: 1. Ocean wave recorders 2. Ocean wave measurement.—A.M.P.*

7.2-58

532.593:551.46

Walden, H., *Neue Forschungen der Geophysik im Dienste der Schifffahrt. Welche Eigenschaften besitzt eine neu aufkommende Dünung?* [New researches on geophysics in the service of navigation. What are the characteristics of newly developed swell?] *Umschau*, Frankfurt, a.M., 55(20):622-625, Oct. 15, 1955. 6 figs. DLC—Swell often originates at a great distance and is dangerous when it is at an angle to wind-sea. The wave length depends on the time of development. Longer waves travel faster but they also take a longer time to form. The results for a 40-kn wind are shown graphically. At 500 naut mi from a stationary wind field, swell of 10 sec period arrives first, at 1500 swell of 19 sec, but other wave lengths soon follow. The height of the swell can also be calculated. With a travelling storm the

results are more complicated but the spectrum can be integrated. The hope is expressed that regular forecasts of swell will some day be possible. *Subject Heading: 1. Ocean swell.*—*C.E.P.B.*

## AERONAUTICAL METEOROLOGY

See also: *Contract weather stations* (Benes), 7.2-77; *Fog at Zurich Airport* (Schneider), 7.2-215.

7.2-59

551.509.58:656.7

Williams, J. E. D., *The value of meteorological forecasts for airline operation. Institute of Navigation, London, Journal*, 8(3):281-283, July 1955. 4 refs. DWB—Reliable landing and route forecasts would greatly alter operation of airlines. Present forecasts, though not a great improvement on using present weather, do give a significant saving. *Subject Heading: 1. Forecasting for airlines.*—*C.E.P.B.*

7.2-60

629.19:612

†Strughold, H. (*Dept. of Space Medicine, U.S.A.F. School of Aviation Medicine, Randolph Air Force Base, Texas*), *Space equivalent conditions within the earth's atmosphere; physiological aspects. Astronautica Acta*, Vienna, 1(1):32-40, 1955. 3 figs., 25 refs. German and French summaries p. 32-33. DBS—Within the astronomically defined atmosphere, conditions are found that are physiologically equivalent to those existing in free interplanetary space. Those that occur at certain topographically fixed levels of the atmosphere are termed *static space equivalent conditions*. These levels are identical with the "functional borders" between atmosphere and space. Some of these space equivalent conditions are caused by the loss of certain vitally important atmospheric factors. The loss of these factors during flight results in anoxia, boiling of body fluids, and the impossibility of utilizing the ambient air for pressurization of the cabin. Other static space equivalent conditions are caused by the appearance, in full force, of certain extraterrestrial factors such as cosmic rays, meteors, etc. These space equivalent conditions show variations in the vicinity of the earth, effected by the solid body of the earth and its magnetic field. The state of zero-gravity as it is encountered in flight is defined as a *dynamic space equivalent condition*. This condition is not associated with any height or distance from the earth. Since some of the biologically significant space equivalent conditions are encountered in present manned rocket flight, space flight is now a reality. *Subject Heading: 1. Space flight physiology.*—*Author's abstract.*

7.2-61

797.55

Scorer, R. S., *National gliding championships, 1955. Weather*, 10(9):307-308, Sept. 1955. photo. DWB—Account of championship tests on July 23-Aug. 1 at Lasham, Eng. *Subject Headings: 1. Gliding championships 2. England.*—*C.E.P.B.*

## INDUSTRIAL METEOROLOGY

7.2-62

628.53:711.4

Introducing a smokeless zone: woman's viewpoint. *Smokeless Air*, London, No. 95: 44-46, Autumn 1955. DWB Reprinted from *Fuel Efficiency*, May 1955.—Argues that tact is essential in introducing compulsory smokeless zones because of the greater cost to householders, delay benefits and "interference with the liberty of the subject." *Subject Heading: 1. Smokeless zones.*—*C.E.P.B.*

7.2-63

662.6:628.53

A trio of fuel reports: National Coal Board, National Industrial Fuel Efficiency Service and Fuel Research Board. *Smokeless Air*, London, No. 95:36-40, Autumn 1955. DWB—The Report of the National Coal Board, 1954, contains many references to progress in implementing the report of the Beaver Committee. The first annual progress survey of the National Industrial Fuel Efficiency Service describes provision for advice to industry and cooperation with other bodies. Fuel Research 1954 deals with a number of problems in coal firing and domestic heating. *Subject Heading: 1. Smoke abatement.*—*C.E.P.B.*

## AGRICULTURAL METEOROLOGY

See also: **Agriculture and weather** (Daigo), 7.2-7; **Prof. Skvortsov** (Babushkin), 7.2-34; **Agromet. review** (Deutsch. Wetterdienst), 7.2-36; **Weather and potato yield** (Müller, Unger), 7.2-79.

7.2-64

551.5:63.06

Ratković, B., **Agrometeorologija u svetu i kod nas**. [Agricultural meteorology in Yugoslavia and abroad.] *Yugoslavia. Hidrometeorološka Služba, Vesnik*, 1(3/4):49-53, July/Oct. 1952; 1(5):93-97, Nov./Dec. 1952. **DWB**—General objectives and problems of agrometeorological research are outlined. Set-up and activities of the Agrometeorological Service of Yugoslavia are described. It is organized as part of the Hydrometeorological Service and comprises a network of 134 agrometeorological and 543 phenological stations. *Subject Headings*: 1. **Agricultural meteorology** 2. **Meteorological services** 3. **Yugoslav Hydrometeorological Service**.—G.T.

7.2-65

551.5:63

de Villiers, G. D. B. (*Western Province Fruit Res. Station, Stellenbosh*), **Importance of weather records in agriculture**. *Farming in South Africa*, 28(324):93-94, March 1953. **DWB**—Author points out the role of meteorological data such as precipitation and temperature records in indicating that the deterioration of the veld is not the result of a secular decline in rainfall, and that animal husbandry, farming, and horticulture require proper temperature and precipitation records. *Subject Heading*: 1. **Agricultural meteorology**.—I.L.D.

7.2-66

551.311.2:631.4 551.578.46:631.4

Fekete, Zoltán, **Küzdelem a szántóföldeket sújtó talajerózió ellen**. [Fight against erosion of arable land.] *Agrártudomány*, Budapest, 5(7):208-211, July 1953. 6 refs. **DLC**—Effective protection against water erosion of the soil calls for a combination of protective measures rather than a single method. Such combined action should consist of the following: 1) regional planning, 2) protective cultivation, 3) soil structure amelioration, 4) rows of trees with entrenchments, 5) proper choice of crops, 6) palisade-like plowing, 7) obstruction to incipient erosion and 8) snow protection. *Subject Headings*: 1. **Soil erosion prevention** 2. **Snow conservation**.—G.T.

7.2-67

551.509.62

Chekotillo, A. M., **Opyt zimnego orosheniia**. [Experiment with winter irrigation.] *Priroda*, Moscow, 43(12):103, Dec. 1954. table. **DLC**—Water irrigation, that is water sprinkling forming ice sheets, was used in the Stalingrad region to combat drought. Data are presented showing that this water irrigation increased the yield of wheat and potatoes. *Subject Headings*: 1. **Sprinkling** 2. **Crop yield** 3. **Drought prevention** 4. **Stalingrad, U.S.S.R.**—I.L.D.

## FOREST METEOROLOGY

See also: **Forest floor influences** (Rowe), 7.2-253; **Thunderstorms and Project Skyfire** (Schaeffer), 7.2-277.

7.2-68

551.5:632.182

Fukuda, H., **On the relation between fire and weather in Himeji**. *Journal of Meteorological Research*, Tokyo, 4(9):711-714, Feb. 1953. 5 figs., 4 tables. In Japanese; English summary p. (44). **DWB**—On the basis of a comparative study of reported fires and meteorological data, the author establishes criteria of fire weather in terms of relative and effective humidity and wind velocity. *Subject Headings*: 1. **Fire weather** 2. **Himeji, Japan**.—G.T.

7.2-69

551.509.58:632.187

Mitchell, J. A. and Olsen, L. P., **Fire occurrence: periodicity of good and bad years**. *U. S. Forest Service, Lake State Forest Experiment Station, Technical Note*, No. 419, July 1954. chart, table. **DWB**—On the basis of 39 years of record of fire occurrence, the possibility of an 8-year fire cycle was established. Using the eight-year average for 1945-1952, the author

estimates the number of fires expected to occur during each year from 1954 to 1961. *Subject Headings: 1. Fire weather forecasting 2. Fire weather cycles.—I.L.D.*

7.2-70

581.54:634.9

Svensson, Harald, *Methode zur Bestimmung der Waldhöhengrenze*. [Method of determining tree-line height.] *Erdkunde*, 9(3):224-225, 1955. 2 figs., table, 3 refs. English summary p. 224. DWB—Describes a "hypsographic" method of determining the general tree-line over an area, eliminating the effects of local climatic conditions. *Subject Heading: 1. Tree-line.—C.E.P.B.*

## METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

### METHODS OF OBSERVATION

See also: *Mt. Wrangel expedition* (Beiser), 7.2-26; *Hurricane reconnaissance* (Sherman, La Seur), 7.2-138.

7.2-71

551.501:551.571:016

†Berger-Landefeldt, U. (Berlin), *Zur Messung der Feuchtigkeit in der Mikroklimatologie und Pflanzenökologie*. [Measurement of humidity in microclimatology and plant ecology.] Berlin. Freie Universität. Institut für Meteorologie und Geophysik, *Meteorologische Abhandlungen*, 2(4):173-195, 1955. 7 figs., 89 refs. DWB—A thorough discussion (with numerous illustrations of recorder records) of various methods of moisture recording or measuring for micro- or plant-climatology research. An extensive bibliography is appended. Lysimeter and evaporation or evapotranspiration methods are included in the discussion. *Subject Headings: 1. Humidity measurement techniques 2. Humidity measurement bibliographies 3. Micrometeorological instruments.—M.R.*

7.2-72

551.501.3:531.75

Baur, Franz, *Wie lange noch dynamisches und geopotentielles Meter?* [How long are dynamic and geopotential meters to be used?] *Meteorologische Rundschau*, 8(5/6):93-94, May/June 1955. MH-BH—States that definitions of dynamic and geopotential meter are false, and discusses them. He recommends using the reduced geopotential meter, defined by ICAO as  $9.80665 \text{ m}^2 \text{sec}^{-2}$ . *Subject Headings: 1. Height units 2. Geopotential meter.—C.E.P.B.*

7.2-73

551.501.4:551.577.36

Schneider-Carius, K., *Zur Frage der statistischen Behandlung von Niederschlagsbeobachtungen, Zweite Mitt.* [On the statistical treatment of precipitation observations, Pt. 2.] *Zeitschrift für Meteorologie*, 9(7):193-202, July 1955. 4 figs., 10 tables, 12 refs. DWB, DLC—Tables of curves are given of frequencies of amount, duration and intensity of individual falls at Potsdam, Wilhelmshaven and Braunlage, and frequency of daily amounts at Potsdam and Berlin. These are plotted on various scales (arithmetical and logarithmic) to bring out the statistical peculiarities. (For Pt. 1, see 6.10-63, Oct. 1955, MAB.) *Subject Headings: 1. Rainfall frequencies 2. Statistical analysis.—C.E.P.B.*

7.2-74

551.501.7:551.547.1

Bartsch, Joachim, *Fragen der Topographien*. [Problems of topography.] Germany. Deutscher Wetterdienst, *Mitteilungen*, No. 10: 38-40, Feb. 1955. fig., 5 refs. DWB—Chart shows areas for which upper air topography chart data are available at 0530, 0645 and 0845 M.E. time. Discussion includes problems of transmission and promptness of receipt of data, comparison of accuracy of radiosondes (homogeneity across national boundaries), and methods of constructing isobars (whether by "difference" method, or from actual data where data is sparse or at high levels). *Subject Headings: 1. Upper air analysis techniques 2. Baric topography charts 3. Transmission of data 4. Western Germany.—M.R.*

7.2-75

551.501.7:551.510.534

Paetzold, H. K., **New experimental and theoretical investigations on the atmosphere ozone layer.** *Journal of Atmospheric and Terrestrial Physics*, London, 7(3):128-140, Sep. 1955. 8 figs., table, 31 refs. DWB—Ozone distribution is measured up to 38 km at Weissenu by ultraviolet balloon spectrographs, and up to 45 km by light on the moon during lunar eclipses. The ozone distribution is a dynamic balance between photochemical constitution, vertical ozone current and advection; at Weissenu advection causes a secondary maximum at 15 km with air of polar origin, greatest in spring. In 10-20 km there is also an increase from early Nov. onwards due to a lowering of the tropopause. In 20-25 km the maximum is in summer. In 25-30 km there is no annual variation, above 30 km a maximum in early summer caused photochemically. The effect of vertical motion is shown by interdiurnal variations especially in autumn, and by an "ozone hole" over the Alps due to the föhn wind. An ozone radiosonde is being developed. *Subject Headings:* 1. Ozone research 2. Weissenu Germany.—C.E.P.B.

7.2-76

551.501.8:52(09)

Bok, Bart J. (Dept. of Astronomy, Harvard Univ.), **New science of radio astronomy.** *Scientific Monthly*, Wash., D. C., 80(6):333-345, June 1955. 5 figs., 7 photos. DLC—nontechnical review of the entire field of radio astronomy from its first beginnings in 1927 when JANSKY of Bell Telephone discovered radio radiation from the Milky Way over entire range from 1 cm to 30 m, thus extending our tools for astronomy from a range of 1000 m to 30,000 Å (5 octaves) to 12 more octaves of the emission spectrum. Antennas have grown from 31 ft in 1937 (REBER at Wheaton, Ill.) to 50 ft at N.R.L. in Wash., D. C., and 75 ft by Dutch to 250 ft at Jodrell Bank by Univ. of Manchester, Eng. Effects of sun on earth's atmosphere are more easily studied by radio frequency radiation variations since they are so sensitive and extreme in variation. Study of discrete sources, the 21 cm line of neutral hydrogen and future of radio astronomy in U. S. are discussed at some length. *Subject Headings:* 1. Radio astronomy 2. History of radio astronomy.—M.R.

7.2-77

551.501.9:37

Benes, Norman S., **Contract weather-station operations.** *American Meteorological Society, Bulletin*, 36(3):131, 141-142, March 1955. 2 refs. MH-BH—In connection with accelerated training program for Air Force pilots during Korean war, contracts for training pilots contained a stipulation that a weather station should be operated in support of the training program. The first contract weather station operated at a nonmilitary base was installed at Spence Air Base, Georgia, with 3 meteorologists from the Univ. of Washington and Florida State Univ. Forecasting and local public service are among the activities. Station operates from 0530 to 2030E. Observations for past 3 years are according to WBAF instructions and are sent to Data Control at Asheville. Cost is about \$20,000 per year. *Subject Headings:* 1. Contract weather stations 2. Spence Air Base, Georgia.—M.R.

## OBSERVATIONAL DATA

See also: **Water-loss investigations** (U. S. Geol. Survey, U. S. W. B.), 7.2-11; **Glacial met. obs.** (Orvig), 7.2-24; **Antarctic shores** (Kirpichnikov), 7.2-27; **Temp. changes** (Keränen), 7.2-162.

7.2-78

551.506:551.578.4

\*§Bergeron, Tor, **Vinterväder.** [Winter weather.] *Sweden. Turistföreningen, Årsskrift*, p. 261-278, 1955. figs. Abstracted from reprint. DWB—Some physical weather processes in the atmosphere and on the ground during the Swedish winter are described. Data on clouds, winds, freezing and thawing are presented for the layman as well as the scientist. Duration and distribution of snow cover are mapped and examples given in relation to synoptic charts. Extreme temperature (cold-pockets) is explained. *Subject Headings:* 1. Winter weather processes 2. Snow cover 3. Sweden.—W.N.

7.2-79

551.506:632:633.491

†Müller, Hans Joachim and Unger, Kurt, *Über die Bedeutung der Zusammenhänge zwischen Witterung und Blattaussflug für die Probleme des Kartoffelabbaus*. [On the importance of the relation between weather and leaf infestation for the problems of decreased potato yield.] *Forschungen und Fortschritte*, 29(8):229-238, Aug. 1955. 6 figs., foot-refs. **DLC**—Causes of decreased potato yield are: 1) soil, macro- and microclimate; 2) increasingly in recent years, virus infections. These are interrelated in a complicated way shown in a diagram by **RONNEBECK**. The movements of the carriers are governed by temperature and humidity, wind, rainfall and light. "Attacking flight" of *Myzodes persica* is prevented by an equivalent temperature below 40°C, wind above 2 m/s, and precipitation. This is illustrated by maps and diagrams for part of Germany. *Subject Heading*: 1. Potato blight weather. —*C.E.P.B.*

7.2-80

551.506.1(861)

\*Federación Nacional de Cafeteros de Colombia, Bogotá, **Anuario Meteorológico, 1952**. [Meteorological Annual, 1952.] pub. 1955? 2 v. (333 p. in both vol.) mostly tables. on t-p of Vol. 1: Observatorio de Chinchina. Also Vol. 1 for 1953, pub. 1955? 115 p. almost entirely tables. **DWB**—In Vol. 1 all hourly meteorological data for Chinchina are published *in extenso*. These include tables of pressure, temperature, relative humidity, precipitation, wind, sunshine, bi-hourly cloud amount, soil temperature thrice-daily (at 8 depths, at surface, and 5 cm above surface), frequencies of wind, cloud, sun, precipitation, temperature, clear and cloudy weather. In Vol. 2 whatever such data are available (hourly, daily or monthly, annual totals, means or frequency) for 5 first order, 4 second order and 22 rainfall stations in Colombia are published in full. Vol. 1 for 1953 contains data similar to 1952 Annual. *Subject Headings*: 1. Annual meteorological reports 2. Soil temperature data 3. Meteorological data 4. Chinchina, Colombia 5. Colombia. I. Trojer, Hans.—*M.R.*

7.2-81

551.506.1(43)

\*Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, **Deutsches Meteorologisches Jahrbuch, 1953, Teil 2, Monats- und Jahresergebnisse**. [German Meteorological Yearbook, 1953, Pt. 2, Monthly and yearly results.] Berlin, Akademie-Verlag, 1955. 180 p. map. mostly tables. **DWB**—Data for 220 second and third order stations, including 18 new stations, are tabulated for each month and for the year. Four times daily temperature, vapor pressure, relative humidity, and cloudiness and all other usual data obtained from synoptic stations, plus special summaries of number of days of frost, ice and hot weather, frost and snow cover limits, 5-day means of pressure, temperature, sunshine and precipitation, departure of 5-day mean temperature from normal, a weather summary, minimum temperatures at 5 cm above ground, sunshine (monthly and hourly), earth temperature at 0.1, 0.2, 0.5 and 1.0 m (4 or 3 times daily and maximum and minimum), and average monthly cloud amount (without cirrus) are tabulated. *Subject Headings*: 1. Annual meteorological reports 2. Soil temperatures 3. Meteorological data 4. East Germany. —*M.R.*

7.2-82

551.506.1(43)

\*Mecklenburg. Amt für Meteorologie und Hydrologie, Schwerin, **Witterungsübersicht, mit hydrologischem Teil**. [Weather review for Mecklenburg, including hydrological section], 7(2), Feb. 1955. 8 p. tables, charts, figs. **DWB**—Summary of weather conditions for Mecklenburg during several periods in the month, and in comparison with normal conditions (temperature, soil temperature, precipitation, snow, fog, cloud, sunshine, weather and plant growth and damage). Data for 27 stations (means, extremes and frequencies), daily temperatures for 3 stations, daily precipitation for 22 stations, soil temperature at 2, 5, 10, 20, 50 and 100 cm for 12 stations, graphs of pressure, temperature, precipitation and sunshine for 3 stations, charts of precipitation and anomaly of precipitation from 1895 1930 normal, and hydrological data and charts are presented in this monthly bulletin. *Subject Headings*: 1. Monthly hydrometeorological reports 2. Hydrologic data 3. Climate of Mecklenburg 4. Mecklenburg, Germany.—*M.R.*

7.2-83

551.506.1 (46)

551.506.8

551.582.2 (46) (059)

\*Spain. Servicio Meteorológico Nacional, *Calendario meteoro-fenológico*, 1955. [Meteorological-phenological calendar, 1955.] Madrid, Sección de Climatología, 1955. 150 p. tables, figs., charts. . . . 1956. 162 p. DWB—This almanac and phenological and climatological summary for Spain is remarkably complete for this type of publication. It contains a summary of instructions for phenological observers, with a history of the phenological service in Spain and a list of plants and birds for voluntary observers to note, four charts of isophenes for 1953-54 for Spain, data from 70 stations (and accompanying charts) on rainfall, highest and lowest temperature, hours of sunshine, number of days with frost, length of frost-free period and a comprehensive article on thunderstorms in Spain (50 stations) for year Sep 1953-Aug. 1954. Annual or seasonal rainfall for each year (1859-1954), and pressure, temperature and rainfall for 1953-54 are shown on extended (fold.) graphs. Much other annual or frequency data, especially on precipitation, is given. The 1956 edition contains data through Aug. 1955, and almanac for 1956 in similar form. *Subject Headings*: 1. Annual climatic reports 2. Phenological summaries 3. Climatic data 4. Almanacs 5. Spain.—*M.A.*

## INSTRUMENT CARRIERS

See also: Science for sale (Solow), 7.2-40; Hurricane reconnaissance (Sherman, La Seur), 7.2-138.

7.2-84

551.507.1:551.524.37:656.1

Winter, Fritz, *Frostkartierung mit Thermoelement am Kraftwagen*. [Frost mapping with a thermo-element in an automobile.] *Meteorologische Rundschau*, 8(5/6):99-100, May/June 1955. DWB—The apparatus is described. Its response was so rapid that minute details of the distribution could be measured. Results will be published later. *Subject Headings*: 1. Frost charting 2. Mobile weather stations.—*C.E.P.B.*

7.2-85

551.507.7

Grandes balões-sonda serão lançados no Campo de Marte. [Large sounding balloons to be launched from the Sao Paulo Campo de Marte.] *Aviação*, Rio de Janeiro, 19(206):3, March 1955. DLC, DWB—Description of polyethylene balloons 24 m in diameter which the U. S. Air Force is launching at Sao Paulo in cooperation with the Brazilian Air Force. The purpose of the balloons is to study the air currents and structure at high flying levels over the Atlantic. *Subject Headings*: 1. Polyethylene balloons 2. Transosondes 3. Sao Paulo, Brazil.—*M.R.*

7.2-86

551.507.321

\*Bellaire, Frank R. (U. S. Navy Electronics Lab., San Diego, Calif.), *Slow-ascent stadia pibals*. *American Meteorological Society, Bulletin*, 36(5):216-219, May 1955. 10 figs., 5 refs. DWB—Report of an experiment carried out with stadia pibals to detect the wave motion during pibal ascents by using a small free lift balloon. The theory of pibal stadia as applied to micrometeorological purposes is developed. The experiment which was carried out near San Diego, Calif., and the equipment are described with the aid of a map and photograph and the results of the soundings are illustrated by charts and graphs. These include a comparison of sharp trajectory changes with the inversion height from radiosonde data, a sounding through a standing lee wave, etc. *Subject Headings*: 1. Pilot balloon ascents 2. Wave motion 3. Stadia pibals 4. San Diego, Calif.—*I.L.D.*

7.2-87

551.507.36

Lawden, D. F. (Dept. of Physics and Math., Coll. of Techn., Birmingham, Eng.), *Optimal programming of rocket thrust direction*. *Astronautica Acta*, Vienna, 1(1):41-56, 1955. 4 figs., 4 tables, 9 refs., 71 eqs. English, German and French summaries p. 41. DBS—The programming of the variation in the magnitude of the thrust of a rocket being supposed fixed by the design of the power unit, the problem is considered of programming the thrust direction to achieve maximum energy increment in the payload over a given period of time. Equations, from which the optimal trajectory may be computed, are derived for the general

case of a rocket moving in a specified gravitational field and subject also to atmospheric resistance. These equations are solved for the case of a rocket moving *in vacuo* in a uniform field. It is deduced that it is advantageous to displace the line of thrust from the direction of motion by a small angle in the sense of the field and steadily to diminish this angle to zero as the maneuver proceeds. This conclusion is tested by considering various methods of escape from a circular orbit, employing a thrust which yields a constant acceleration. *Subject Headings: 1 Rocket pointing control mechanism 2. Rocket thrust.—Author's abstract.*

## INSTRUMENTS

See also: Seasonal trends of temp., density & pressure (Elterman), 7.2-9; Physical measurements (Renzetti et al.), 7.2-117; Atmos. emission spectrum (Sloan et al.), 7.2-158.

7.2-88

551.508.21

Ianishvetskii, I. U. D., *Proverka pirgeliometricheskoï shkaly*. [Verification of the pyrheliometric scale.] *Meteorologiya i Gidrologiya*, Leningrad, No. 1:48-49, Jan./Feb. 1955. table. DWB—Data on the comparison of various pyrheliometers used in the Soviet Union with the Angstrom No. 212 pyrheliometer as a standard. A variation of 1% from the standard scale was found. The comparison of pyrheliometer No. 250 with No. 212 and with other pyrheliometers is discussed. The pyrheliometer of the Central Geographical Observatory has a systematic error of not more than 1%. *Subject Headings: 1. Pyrheliometer comparisons 2. Angstrom pyrheliometer.—I.L.D.*

7.2-89

551.508.26:551.508.71

Heckert, L., *Die Trägheit feuchter Thermometer im Assmann-Psychrometer*. [The lag of wet-bulb thermometers in the Assmann psychrometer.] *Zeitschrift für Meteorologie*, 9(7):210-216, July 1955. 6 figs., 3 refs. DWB—The lag of the wet-bulb in an Assmann psychrometer is less than that of the dry-bulb, but varies with the wet-bulb temperature and shape and size of the bulb. At 18°C it is only about half the dry-bulb lag. The lag increases with the size of the bulb but to make it comparable with the dry-bulb the wet-bulb would be too large for the ordinary psychrometer tube. The difficulty can be got over by covering the wet-bulb with a layer of insulating material such as stearin. *Subject Headings: 1. Wet bulb thermometer lag 2. Assmann aspiration psychrometer.—C.E.P.B.*

7.2-90

551.508.29:551.584.43

Biel, E. R.; Havens, A. V. and Sprague, M. A. (all, Col. of Agri., Rutgers Univ., New Brunswick, N. J.), *Some extreme temperature fluctuations experienced by living plant tissue during winter in New Jersey*. *American Meteorological Society, Bulletin*, 36(4):159-162, April 1955. 3 figs., 2 refs. DWB—Ladino clover stolon temperatures were measured in an experimental pasture plot from Feb. 9 to March 9, 1954 by inserting copper constantan thermocouples into unshaded clover stolons exposed above the ground and recording by means of a potentiometer. The Ladino air-soil temperatures are presented in graphs and they indicate that cooling rates occur in nature similar to those in the laboratory. *Subject Heading: 1. Plant temperature measurement.—I.L.D.*

7.2-91

551.508.71

Kachurin, L. G., *O kondensatsionnom psikhometre*. [The condensation psychrometer.] *Meteorologiya i Gidrologiya*, No. 2:41-42, March/April, 1955. 6 refs., 9 eqs. DLC—The author analyzes the physical and chemical basis of the condensation psychrometer of B. V. KRIUKHIN in which the thermometer is wetted with a saturated solution of NaOH, NaCl and CaCl<sub>2</sub>. The relationship between atmospheric moisture and the temperature of the thermometer and the relationship between the formula for the condensation psychrometer and that of an ordinary psychrometer are analyzed. It is maintained that the assumption of a sufficiently large time interval during which the temperature of the wetted thermometer does not change does not hold for the condensation psychrometer. *Subject Heading: 1. Condensation psychrometers.—I.L.D.*

7.2-92

551.508.72 551.573:551.524

Glazova, E. F. and Laikhtman, D. L., **Elementarnaiia teoriia uvlazhnennogo isparitel'nogo i ego primeneniie dlia izucheniia turbulentnosti**. [Elementary theory of moist evaporimeter and its use in investigation of turbulence.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofiz.*, No. 3:278-281, 1955. figs., 5 tables, ref., 6 eqs. **DLC**—The method involves the use of a constantly moist evaporimeter which is described with the aid of a diagram. The results of measured and calculated evaporation and the measured and calculated hourly values of the coefficient of temperature for Pakhta-Arala and Koltush are compared. *Subject Headings*: 1. **Evaporimeters** 2. **Evaporation measurements** 3. **Temperature effects on evaporation**.—I.L.D.

7.2-93

551.508.822

\*†Malet, L. M., **Diverses expériences de comparaison de radiosondes**. [Various results of radiosonde comparisons.] *World Meteorological Organization, OMM*, No. 35, TP11, *Technical Note*, No. 5, 1954. 11 p. tables, 13 refs. English, Spanish and Russian summaries, preceding p. 1. **DWB**—The systematic differences, deviation in pressure, temperature and relative humidity, etc. based on Payerne (Switzerland) comparisons of 6 types of radiosondes, and consequences for synoptic analysis are discussed and summary of data included in tables. The Oklahoma City comparisons (June 1951) are next reviewed, and the Jumele soundings (comparing Finnish, English and French radiosondes, night and day) are discussed. Causes of both random and systematic errors and care to be exercised by analysts for data above 500 mb level are pointed out. Finally, a study of homogeneity of European radiosonde network records is reviewed. *Subject Headings*: 1. **Radiosonde comparisons** 2. **Radiosonde accuracy**.—M.R.

7.2-94

551.508.94

Wagner, Richard, **Zur Messung des luftelektrischen Potentialgefälles mittels Kollektoren**. [On the measurement of the atmospheric electric potential gradient by collectors.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):427-464, 1955. 18 figs., 17 refs., 45 eqs. German, English and French summaries p. 427-428. **DWB**—Radioactive collectors and water collectors are described and their principles explained. "The second part deals with the unipolar current of spherical symmetry within a spherical condenser and gives the first approximation for the solution of this problem. The course of field strength, of density of free electric charge, and of potential-function are examined and discussed. In a spherical condenser the characteristic of the current as a function of tension is determined by experiments for a radioactive substance. The first part of the curve which describes the start of this characteristic can be expressed by a function which is the limit of the general potential-function, if we use very small currents. Here, some definitions are formally given which are already used in the technique of electronic tubes. If we want to proceed from a unipolar current, taking a radial course in a spherical field, to a radioactive collector within a homogeneous field, we have to examine the conditions of two ion-currents which have opposite signs and start their course from a double source into an homogeneous field. This examination is qualitatively done in the third part and results in proving that the radioactive collector should not be too highly charged, as its resistance of transition depends on the tension which has to be measured." *Subject Headings*: 1. **Potential gradient measurement** 2. **Potential gradient meters**.—Author's abstract.

## SYNOPTIC ANALYSIS AND FORECASTING

See also: **Long range forecasting** (Takahashi), 7.2-5; **Airline forecasting** (Williams), 7.2-59; **Winter irrigation** (Chekotillo), 7.2-67; **Fire weather forecasting** (Mitchell, Olsen), 7.2-69; **Fog and low stratus** (Schneider), 7.2-215.

7.2-95

551.509(243.3)

Piersig, Walter, **Erfahrungen im Vorhersagedienst für das Alpengebiet**. [Experience of the forecasting service for the Alpine region.] *Germany. Deutscher Wetterdienst, Mitteilungen*, No. 10:72-79, Feb. 1955. 3 figs., 2 refs. **DWB**—Author discusses the irregularity

of weather processes in the Alpine region of Germany and Austria and points out the difficulty of forecasting individual phenomena due to the singularity of their causes and effects. It is shown that due to this irregularity and the scarcity of meteorological stations, meteorologists in Alpine regions have to use different criteria than those in the plains regions when they forecast. In the Alpine region severe weather, storms, hail and hurricane gusts are linked mostly with SW situations with "high level troughs over West Europe." The advance or "running over" of cold upper air masses from SW and W by further simultaneous advective or radiative warming of the lower air layers is a decisive factor. This explains the difficulty of giving timely storm and avalanche warnings which, in spite of the efforts of the Weather Service, are still inadequate in the Alpine region. *Subject Headings:* 1. Weather forecasting 2. Atmospheric circulation 3. Air masses 4. Topographic effects 5. Alpine Regions.—A.M.P.

7.2-96

551.509:061 (26:435.51)

Seilkopf, H., *Wetterkarten für die Schifffahrt. Weiterentwicklung der Wetterkarte des Seewetteramtes und ihrer Sonderausgaben für den Hamburger Hafen und den Nordostseekanal.* [Weather charts for navigation. Further development of the weather chart of the Marine Office and its special issues for the Hamburg Harbor and Kiel Canal.] *Wetterlotse*, No. 92:180-185, Sept. 1955. 3 figs. DLC—The 13h chart of the Marine Office at Hamburg covers the North Atlantic and northern fisheries and in Jan. 1955 the Mediterranean and Black Sea were added and the accompanying data increased. From April a weekly series of 7 small 500 mb charts was given, with notes; examples are shown. The title page contains meteorological articles. From July 1 simple charts for Hamburg region and lightship observations were broadcast. Similar broadcasts for the Kiel Canal were made from Kiel. *Subject Headings:* 1. Marine meteorological services 2. Germany.—C.E.P.B.

7.2-97

551.509.52

§Hoose, Harry M. (*U. S. W. B. Airport Station, San Juan, Puerto Rico*), *October gales in Southeast Alaska.* U. S. Weather Bureau, Feb. 11, 1955. 6 p. charts, table, 2 refs. DWB—The most hazardous storms to affect the fishing fleets in S.E. Alaska are the October cyclones which bring E or SE gales after periods of relatively good weather. Two types are recognized: 1) shallow, rapidly developing and moving cyclones which pass northeastward over the Juneau area into Canada and 2) deep cyclones which move into the Juneau, Cape Spencer area and stall or weaken while a new center forms in the lee of the Cordillera. Type 1 begins as a wave on a cold front or occlusion, Type 2 is usually the first or second occluded wave of a series. Characteristics of 4 Type 1 storms and 4 Type 2 storms in 1950-53 are described and tabulated, and 6 synoptic charts for a Type 1 storm (Oct. 6-8, 1951) are presented and analyzed. *Subject Headings:* 1. Gale forecasting 2. Cyclone forecasting 3. Local forecast studies 4. South east Alaska.—M.R.

7.2-98

551.509.3:551.509.5

\*Faust, Heinrich, *Studien zur Wettervorhersage.* [Studies in weather forecasting.] Germany. *Deutscher Wetterdienst, Mitteilungen*, No. 10:88-95, Feb. 1955. 3 tables, 25 refs. DWB—A statistical investigation of accuracy of weather forecasts issued by the former Central Office of the German Weather Service in the U. S. Zone for 1951 and 1952 shows that only 18% of the incorrect forecasts are caused by misinterpretation of the pressure field development, and that 35% of erroneous predictions are due to the impossibility of anticipating vertical movements. The author discusses these results and outlines the prospects of improving weather forecasts as indicated by the results of the investigation. The first mentioned 18% of incorrect forecasts are mainly caused by the fact that in summer cold air masses are considered to be unstable, and warm masses, stable. This is contradicted by the author who shows that in summer: 1) cold fronts are followed by a subsequent stabilization more often than warm fronts, and warm fronts cause a following instability more often than cold fronts; 2) the rear of a low due to sinking is in average more stable, than any other of its sectors; maritime warm air is, in the average less stable than Polar air. Further, air temperatures in cases of warming after bad weather are often forecasted too low. Forecasts of relative topography are always used for the forecasting of absolute topography, which is not always

correct. Finally, the author points out that the difficulty of detecting the vertical motion of air, which is the main cause of incorrect forecasts could be greatly reduced by a better study of the zero layer effect. *Subject Headings:* 1. Weather forecasting 2. Forecast accuracy 3. Air masses 4. Vertical motion 5. Germany.—A.M.P.

7.2-99

551.509.312

Flohn, Hermann, *Zur Entwicklung der Wettervorhersage*. [The development of weather forecasting.] *Germany. Deutscher Wetterdienst, Mitteilungen*, No. 10:80-87, Feb. 1955. 2 tables, 13 refs. DWB—General review of the progress made in meteorology during the last 50 years with emphasis on weather forecasting, especially "numerical forecasting" outlined in 1904 by V. BJERKNES and systematically developed at the present time in the U. S. A., England and the Scandinavian countries. In spite of the shortcomings of the method which in its present state has to disregard such important factors as warming and cooling, condensation and precipitation, and in view of the necessity to expedite the much too complicated procedure from observation to forecast, the author concludes that the German meteorologist must do all they can to remedy these shortcomings and lead Central European meteorology along the lines of modern development. Synoptic processes are classified into 5 categories: micro-, local-, regional-, macro- and global synoptics, and characteristics of these types and type of forecasts which correspond to the time scale involved are given. *Subject Headings:* 1. Progress in meteorology 2. Numerical forecasting 3. Germany.—A.M.P.

7.2-100

551.509.312

Dannevig, Petter, *Vaervarslingen ved korsveien*. [At the cross road in weather forecasting.] *Naturen*, Bergen, 79(8):226-233, 1955. DLC—General methods of weather forecasting in the last century are reviewed. The evaluation of any synoptic weather situation still depends on the human and strictly individual way of interpretation. Technical and mechanized aids, e.g., synoptic statistics and computers should prove profitable to the Norwegian meteorologists and their forecasts. *Subject Headings:* 1. Forecasting techniques 2. Forecast aids.—W.N.

7.2-101

551.509.312

Hollmann, Günther, *Probleme der numerischen Wettervorhersage*. [Problems of numerical forecasting.] *Germany. Deutscher Wetterdienst, Mitteilungen*, No. 10:96-100, Feb. 1955. fig. DWB—Contains a general review of the problem. The recent rise in popularity of numerical forecasting is due to: the current three dimensional observation network; the fact that basic investigations of dynamic aerology have produced simplified differential equations and model of atmospheres reproducing the real atmosphere to a large extent, and that complicated and difficult calculations can now easily be made with aid of mechanical computers. The time problem, errors of the basic material, reduction of equations, the barotropic model, the influence of baroclinicity and the method of solving the differential equations by substitution with a difference equation are finally discussed. *Subject Headings:* 1. Numerical forecasting 2. Computing machines 3. Barotropic model.—A.M.P.

7.2-102

551.509.312

Hollmann, G., *Über die Behandlung barokliner Prognoseprobleme mit Hilfe nicht-geostrophischer Gleichungen*. [On the treatment of baroclinic forecasting problems with the help of non-geostrophic equations.] *Meteorologische Rundschau*, 8(5/6):73-78, May/June 1955. fig., 5 refs., 71 eqs. DWB—Simple fields are solved by linearized equations comparing geostrophic and non-geostrophic integration methods. As the general equations of motion besides synoptic processes, include irrelevant phenomena in their solution, the vanishing of the divergence of horizontal flow meaned over the vertical is used as a condition for the elimination of external gravity waves. This condition applies however only in an indifferently stratified atmosphere (advection model) for filtering out all irrelevant processes. Especially for short waves in a baroclinic atmosphere there are considerable differences between geostrophic and non-geostrophic calculated fields. To eliminate the internal gravity waves in a hydrostatically stratified atmosphere a slight modification of the thermodynamic equation is introduced while the equations of motion retain their original form. The resulting method of step in

tegration of then on-linear equations is described. *Subject Heading: 1. Numerical forecasting.*—*Transl. of author's abstract.*

7.2-103

551.509.317:551.543.5

Reuter, H., **Bodendruckänderung und Winddivergenz auf isobaren Flächen.** [Surface pressure change and wind divergence on isobaric surfaces.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):321-331, 1955. 4 figs., 6 refs., 8 eqs. German, English and French summaries p. 321-322. **DWB**—Surface pressure tendencies estimated from upper pressure contours by SCHERHAG's divergence theory sometimes show serious errors. In a stationary upper flow a contribution to surface pressure changes from a given level only occurs if the vorticity decreases downstream. Near a frontal zone vorticity in the center is mainly due to wind shear but in the entrance and exit areas to the wind velocity and radius of curvature. Hence, a pressure fall in the "delta" can only be expected if the wind velocity  $\times$  curvature is less than the wind shear. There is a limiting radius of curvature for which there is no divergence and no contribution to pressure fall. This occurs with blocking action. These principles are applied to charts for Feb. 25, 1954, and shown to be useful in short-range forecasting. *Subject Heading: 1. Barometric tendency calculation.*—*C.E.P.B.*

7.2-104

551.509.317:551.511

Sanders, Frederick and Kessler, Edwin, III (*both, M.I.T.*), **A test of the application of vorticity charts.** *American Meteorological Society, Bulletin*, 36(6):251-255, June 1955. 6 figs., table, 4 refs., eq. **DLC, DWB**—A brief description is given of the preparation of charts depicting vorticity and space-mean flow patterns, in a manner similar to that proposed by FJØRTOFT (1952). A comparison of the velocity of pronounced vorticity centers and the velocity of the wind over the centers indicated by the space-mean flow pattern is made from a series of daily charts for the autumn and early winter of 1953. It is found that the directions of motion of the centers and of the winds do not differ by more than ten degrees in slightly more than half the cases. A correlation coefficient of  $+0.69$  is found between the speed of the centers and the speed of the winds. Use of the space-mean wind as a method of forecasting the displacement of the vorticity centers appears to be superior to the use of extrapolation. Application of the Rossby wave formula to all ridges and troughs in the space-mean flow patterns yields forecasts of the displacement of these features which are slightly better than extrapolation forecasts. *Subject Headings: 1. Forecasting vorticity centers 2. Vorticity transfer.*—*Authors' abstract.*

7.2-105

551.509.33:551.577.33:551.521.1

\*Abbot, Charles Greeley, **Sixty-year weather forecasts.** *Smithsonian Miscellaneous Collections*, 128(3), April 28, 1955. 22 p. 11 figs., 6 tables. **DLC**—Precipitation and partial temperature records for St. Louis, Mo., and Peoria, Ill., were analyzed for hidden periodicities, all sub-multiples of  $22\frac{1}{2}$  years, the basic period in solar radiation suggested by the author. A precipitation forecast up to the end of 1957 promises a "relief from the prevailing distressing drought." "The only fly in the ointment" is volcanic eruptions, atomic bombs, wars and similar disturbances, which spoiled the picture in preceding years. *Subject Headings: 1. Periodicities 2. Solar influences 3. Long range precipitation forecasting 4. St. Louis, Mo. 5. Peoria, Ill.*—*A.A.*

7.2-106

551.509.33:551.577.33:551.521.13

Abbot, Charles Greeley, **Washington, D. C., precipitation of 1954 and 1955.** *Smithsonian Miscellaneous Collections*, Wash., D. C., 128(2), March 1, 1955. 4 p. fig., 2 tables, 2 refs. **DLC**—The average rainfall for 177 "preferred" days in 1954, predicted by the 27.0074 day cycle, was 1.31 times all other days. A prediction is given for 1955. *Subject Headings: 1. Long range precipitation forecasting 2. Rainfall periodicities 3. Washington, D. C.*—*C.E.P.B.*

7.2-107

551.509.33

Oliveira, Antonio Mário de, **Boletim Meteorológico, 1955 (Abril-Junho).** [Meteorological Bulletin, April/June 1955.] Braga, Portugal, Editorial Franciscana Montariol,

[1955?] 18 p. DWB. Also his: *Agenda. Cosmo meteorológica, 1955 (Abril-Maio)*. [Supplement. Cosmic meteorology, April/May, 1955.] Faro, Portugal, March 25, 1955. DWB—Forecast for each day of April-June, 1955, issued on March 14 and 25, 1955, sometimes in general terms and sometimes specifically mentioning places or types of weather expected. The "agenda" goes into even more detail for April and May, 1955. *Subject Headings*: 1. Weather forecasting 2. Long range forecasts. 3. Portugal.—M.R.

7.2-108

551.509.53:551.509.317

§Kibler, C. L.; Lennahan, C. M. and Martin, R. H. (U. S. W. B., WBAN Analysis Ctr., Wash., D. C.), *Temperature forecasting as an implicit feature in prognostic charts: a case study for Jan. 23-31, 1955*. *Monthly Weather Review*, 83(1):23-30, Jan. 1955. figs. p. 24-29, table, 4 refs. DWB—Relation between thickness anomalies (surface to 500 mb) and surface temperature anomalies is investigated in order to see how well maximum or minimum temperatures at surface can be forecast from prognostic thickness charts or vice-versa. The various charts (prognostic and observed thickness anomaly, minimum and maximum temperature anomaly and sea level pressure) for eastern U. S. for Jan. 23-31, 1955 are reproduced in a form making comparison easy. Influence of local factors such as mountains, valleys, lakes, inversions, etc. must be properly interpreted and corrections applied by local forecasters who are acquainted with these conditions. Best correlation is when fresh cold air outbreaks occur; poorest correlation when anomalies are due to radiation (inversion conditions). *Subject Headings*: 1. Temperature forecasting 2. Thickness pattern forecasting 3. Temperature-thickness correlations.—M.R.

7.2-109

551.509.59:551.311.182

Vulatov, S. N., *O nekotorykh sluchaiakh prognoza vskrytiia rek*. [Several cases of river ice breakup forecasting.] *Meteorologiya i Gidrologiya*, No. 2:33-35, March/April, 1955. fig., ref. DLC—Owing to a lack of data on mean ice thickness and amount of snow cover it is impossible to determine directly the amount of heat necessary to cause the breaking up of frozen rivers. The forecasting of ice breakup is attained indirectly by determining the relationship between the amount of heat necessary for ice breakup, the sum of negative air temperatures during the period of river freezing and the mean water level during the same period. The application of this relationship for the ice breakup of the Tyma River at Alotzmor on Sakhalin Island is illustrated. *Subject Headings*: 1. River ice breakup 2. Ice breakup forecasting 3. Tyma River, Sakhalin Island.—I.L.D.

7.2-110

551.509.59:551.579

Sapozhnikov, V. I., *K prognozu mesiachnogo stoka r. Volgi u Kuibyshevskoi GES vo vremia vesennego polovod'ia*. [Monthly runoff forecasting for the Volga River at Kuibyshev Hydro-Electric Station during spring floods.] *Meteorologiya i Gidrologiya*, Leningrad, No. 1:33-36, Jan./Feb. 1955. 2 figs., 3 refs., 8 eqs. DWB—A formula is developed for forecasting the mean monthly flow of the Volga River at the Kuibyshev Hydro-Electric Station on the basis of the atmospheric temperature during the period of snow melt. The formula is  $Q_n + 30 = 0.1545 W_n + 9000 t_2 e^{-0.0062 t_2}$  where  $W$ —total flow of water in the river basin,  $t_2$ —mean atmospheric temperature of the river basin. *Subject Headings*: 1. Runoff forecasting 2. Volga River, U.S.S.R.—I.L.D.

7.2-111

551.509.62

Sauberer, F., *Versuche mit Frosträuchermitteln*. [Experiments with anti-frost smoke devices.] *Wetter und Leben*, Vienna, 7(1/2):32-34, 1955. ref. DWB—The physical principles underlying the use of smoke producing agents in frost prevention and the results of investigations carried out at Zentralanstalt für Meteorologie und Geodynamik on smoke producing devices in particular, and their effect in reducing counter radiation are discussed. The Tauno-Laine procedure, the "Fumer" bullets and  $\text{SO}_2\text{-NH}_3$  fog producing method are described and their effectiveness is discussed. *Subject Headings*: 1. Frost prevention 2. Smoke producing devices.—I.L.D.

## STRUCTURE AND PHYSICS OF THE ATMOSPHERE

### COMPOSITION OF THE ATMOSPHERE

See also special bibliography on **Climate of Enclosed Spaces**, p. 211.

7.2-112

551.510.41:546.17:546.21

Nicolet, Marcel, **The aeronomic problem of nitrogen oxides.** *Journal of Atmospheric and Terrestrial Physics*, London, 7(3):152-169, Sept. 1955. 67 refs., 32 eqs. DWB—The distribution of nitrogen oxides in the upper atmosphere is discussed from theoretical considerations and a small amount of spectrographic material. The dissociation of nitrogen molecules in NO formation is discussed; it is found that the vertical distribution is strongly influenced by vertical motion. The total number of NO molecules at different heights is calculated. The life of NO<sub>2</sub> molecules in sunlight is too short to permit a departure from photoequilibrium. The D layer is attributed to a concentration of  $1-5 \times 10^9$  mol/cm<sup>3</sup> near 65 km. *Subject Headings: 1. Atmospheric composition 2. Nitrogen oxides.*—C.E.P.B.

### ATMOSPHERIC POLLUTION

7.2-113

551.510.42:628.53

**The Clean Air Bill.** An outline of its provisions. *Smokeless Air*, London, No. 95:18-21, Autumn 1955. fig. Also: **The Bill**, *ibid.*, p. 15-17; **Comment on the Bill**, p. 21-23, 25. DWB—The Nabarro "Bill to make provision for abating the pollution of the air" is summarized and commented on. "Ringelmann No. 2," adopted as the standard, is illustrated. Some criticisms are made in the Editorial, "The Bill." Newspaper comments are quoted; they are mainly favorable but the provisions for exceptions for industry are criticized. *Subject Heading: 1. Smoke abatement.*—C.E.P.B.

7.2-114

551.510.42:612.2

**Dust and health in industry.** *Nature*, London, 176(4486):761-764, Oct. 22, 1955. DWB—Account of discussion in Physiology section of British Association. Speakers dealt with problem of measuring airborne dust and physiology of respiratory tract, pneumoconiosis especially in coal workers, protection against inhaling dust, byssinosis in cotton workers, etc. Some references are made to ventilation standards. *Subject Headings: 1. Dust meters 2. Physiology.*—C.E.P.B.

7.2-115

551.510.42

Hitchcock, Lauren B., **General statistical data of the Los Angeles Basin.** Air Pollution Foundation, Los Angeles, Calif., First Technical Progress Report, 1954. pub. March 1955. p. 68-73. fig., tables, 3 refs. DWB—The study of statistical data in relation to the smog problem made by NEIL GOEDHARD, concerned the area of 1) Los Angeles region, 2) Orange County region, 3) San Fernando Valley region and 4) San Gabriel Valley region, limited by the natural boundaries of mountain ranges and the ocean, which hinder the unobstructed dispersal of atmospheric elements in an area of 1,629.7 sq mi. The statistical data deal with a) the population from 1930 to 1954 and population estimates for 1960, b) motor vehicle registration and gasoline and diesel fuel consumption, c) incinerators and rubbish disposal and d) refinery emissions. A table showing the compared hydrocarbon vapor losses resulting from the production, refining and bulk marketing of petroleum products in Los Angeles County as of March 1954 is included. Efforts of refining companies in reducing hydrocarbon losses are pointed out. *Subject Headings: 1. Atmospheric pollution studies 2. Smog 3. Los Angeles, Calif.*—A.M.P.

7.2-116

551.510.42

\*Neiburger, Morris, **Meteorological aspects.** Air Pollution Foundation, Los Angeles, Calif., First Technical Progress Report, 1954, pub. March 1955. p. 16-27. 4 figs., 4 tables. DWB—As a result of the author's report (in connection with Dr. J. E. EDINGER) entitled **Summary report on meteorology of the Los Angeles Basin with particular respect to the "smog" pollution** (see 6.6-148, June 1955, MAB), which showed that systematic measurements of pollution concentrations and effects were lacking in correlating meteorological condi-

tions and smog, two investigations were carried out: 1) an air tracer study to test the reliability of trajectories computed from surface wind reports and to see whether discrepancies could be explained on the basis of upper air winds and 2) a study of the past visibility records to see how much visibility had been reduced by pollution, and to examine any evidence of improvement due to control measures. Results of the air tracer study, shown in tables and charts, indicate that errors appear to be present even when the inversion is low. Two measures seem desirable in seeking improvement: 1) establishment of new stations to fill the gaps in the surface station network and 2) the calibration of the whole network. The procedure used in the visibility test is described. Some improvement has been obtained by introducing control measures. A suggested project to install a line of giant windmills which would blow away the smog is impractical because of the effects of confining mountains, the opposing pressure forces and the roughness of the terrain. *Subject Headings:* 1. Atmospheric pollution 2. Smog 3. Atmospheric pollution microclimatic surveys 4. Temperature inversion 5. Upper air winds 6. Los Angeles, Calif.—*A.M.P.*

7.2-117

551.510.42:551.508.952

Renzetti, Nicholas; Rogers, Lewis H. et al., **Physical measurements.** Air Pollution Foundation, Los Angeles, Calif., First Technical Progress Report, 1954, pub. March 1955. p. 74-86. 6 figs., 24 refs. **DWB**—Investigation of direction, identification and concentration of contaminants in smog, based on physical characteristics, includes the following: 1. The obtaining of more definitive data on the presence of ozone in the atmosphere, which has been found to be one of the most important constituents of Los Angeles smog, with an ozone spectrometer manufactured by the Borman Engineering Co. 2. Solar spectrometric analyses of smog to be carried out with a C. Leiss double prism or mirror monochromator designed and operated by R. Stair and a Perkins-Elmer spectrometer to determine the presence of new absorption bands in the spectral region. 3. Investigation of the presence of carbon isotopes in Los Angeles atmosphere with a mass spectrometer which can detect changes of 0.01% in the  $C^{12}/C^{13}$  ratio. 4. Nuclear magnetic resonance (n-m-r) spectrometric determination of the existence of unmodified unburned gasoline in Los Angeles atmosphere to identify the gasoline components responsible for the manifestation of smog. 5. Study of the paramagnetic resonance spectra of gases to detect and identify free radicals formed in an initial mixture of hydrocarbon and air with aid of a special spectrograph assembled at Varian. 6. Long path infrared absorption cell study and 7. Microwave absorption spectroscopy to determine propagation characteristics of certain gases. All enumerated projected measurements are discussed in detail with an analysis of their background, status and future plan of application. *Subject Headings:* 1. Atmospheric pollution 2. Ozone in smog 3. Ozone spectrometers 4. Monochromators 5. Atmospheric pollution measurements 6. Los Angeles, Calif.—*A.M.P.*

7.2-118

551.510.42:628.53

Scorer, R. S., **An effect of gas washing at Battersea Power Station.** *Smokeless Air*, London, No. 95:26-28, Autumn 1955. 3 figs., 2 refs. **DWB**—Gases in unwashed smoke plumes are hot and buoyant, and rise at an angle of 5-30°. Washed plumes are cooled by evaporation of the water droplets, acquire negative buoyancy and descend. Even the concentration of  $SO_2$  at the ground is greater with washed than unwashed plumes. *Subject Headings:* 1. Atmospheric pollution 2. Gas washing.—*C.E.P.B.*

7.2-119

551.510.42:662.2:539.1

Sittkus, A., **Beobachtungen an radioaktiven Schwaden von atomtechnischen Versuchen im Jahre 1953/54.** [Observations of radioactive swathes from atomic experiments in 1953/54.] *Naturwissenschaften*, 42(17):478-482, Sept. 1955. 5 figs., table, 11 refs. **DWB**—Radioactive products of an atomic explosion can be traced half or a third way round the globe. Rain and snow bring them down and the natural level on the ground may be doubled. A systematic investigation of the radioactivity of air and rainwater was carried out in and near Freiburg following the Nevada and Marshall Island explosions. The amount was very variable from day to day. A method of determining the date of an explosion is described. Use of radioactive products as indicators of atmospheric currents is discussed. *Subject Heading:* 1. Atomic explosion effects.—*C.E.P.B.*

## UPPER ATMOSPHERE—IONOSPHERE

See also: **Ionospheric research** (Jones), 7.2-1; **Seasonal trends of temp., density & pressure** (Elterman), 7.2-9; **Ozone research** (Paetzold), 7.2-75.

7.2-120

551.510.5:519

Solot, Samuel V. and Keegan, Thomas J. (*U. S. A. F., Cambridge Res. Center*), **An extension to 100,000 feet of the U.S.A.F. standard cold and hot atmospheres.** *American Meteorological Society, Bulletin*, 35(10):472-475, Dec. 1954. 3 figs., 3 tables, 9 refs. **MH-BH**—On the basis of radiosonde observations from selected tropical and Arctic stations and of seasonal summaries of data at 25 mb and above, the U.S.A.F. standard hot and cold atmospheres was extended from 60,000 ft to 100,000 ft. The difference method was used instead of computing standard deviations and extrapolating along the Gaussian curve. "Graphs of the hot and cold atmospheres for each of four latitudinal zones from sea level to 100,000 ft and a table of heights and temperatures at critical points along straight-line envelopes enclosing all zonal curves" are presented. *Subject Headings: 1. Standard atmosphere 2. Difference method of averaging.—I.L.D.*

7.2-121

551.510.53

†Thompson, Warren E., **The mean molecular weight of the upper atmosphere.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 36, May 1955. 26 p. 16 figs., 44 refs., 8 eqs. **DWB, DLC**—Photochemical dissociation of the molecular constituents of the upper atmosphere results in a monotonic decrease with altitude of the mean molecular weight of air. The numerous theoretical papers and limited experimental data have been reviewed in order to determine the extent of molecular dissociation. Accordingly, the variation of mean molecular weight with altitude, dependent upon dissociation of molecular oxygen only, has been determined. This probable distribution is tentatively a good estimate based on available information. Requirements for further research necessary for the solution of this problem are also reviewed. *Subject Headings: 1. Upper atmosphere 2. Molecular density 3. Molecular dissociation.—Author's abstract.*

7.2-122

551.510.534

Paetzold, H. K. (Weissenau), **Zum Jahresgang des totalen Ozonbetrags.** [Annual variation of total ozone amounts.] *Berlin. Freie Universität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(4):92-98, 1955. 9 figs. **DWB**—On the basis of 25 balloon ozone soundings by the author at Weissenau, and by other authors at other places, it was found that the greatest amount of ozone occurs about 22 km, and that it decreases sharply to about 30 km when it again increases. The advective (polar), dynamic (turbulent) and photochemical factors involved in the annual O<sub>3</sub> variations in the 0-30 km levels are analyzed in connection with observed distributions and synoptic or astronomical conditions. The greatest seasonal amplitude occurs at about 15 km and O<sub>3</sub> reaches a maximum in N. Hemisphere in spring, especially when polar air invades temperate latitudes. The amplitude is at a minimum above 20 km, but increases around 30 km due to photochemical processes, though diurnal factors (UV dissociation) are paramount in those levels. Below 20 km the diurnal variations cannot be determined without more data. *Subject Headings: 1. Annual ozone variations 2. Seasonal ozone variations 3. Diurnal ozone variations 4. Advection of ozone 5. Weissenau, Germany.—M.R.*

7.2-123

551.510.535:621.396.12

Bramley, E. N., **Some aspects of the rapid directional fluctuations of short radio waves reflected at the ionosphere.** *Institution of Electrical Engineers, London, Proceedings, Ser. B.*, 102(4):533-540, July 1955. fig., 2 tables, 48 eqs. **DWB**—Measurements have been made of the rapid directional fluctuations observed on single-component first-order ionospheric echoes, at vertical and oblique incidence (range 700 km), and on frequencies of 2.5-10.5 Mc/s. Under quiet ionospheric conditions the r.m.s. angular deviations are of the order of 1° or less, but they are appreciably greater under ionospheric-storm or spread-F conditions. The fluctuations are uncorrelated at an interval of five seconds. It is shown that a layer of irregular ionization-density within region E would account for the quiet-condition F layer results, and this would

require random variations of the phase path through the region of the order of only 3 m at frequency of 5 Mc/s. The E layer results appear to be affected by partial reflections at different levels within the region. Appendix gives **Theory of rapid directional fluctuations produced by ionospheric irregularities.** *Subject Headings:* 1. Radio wave propagation disturbances 2. Ionospheric echoes.—*Author's abstract.*

7.2-124

551.510.535:621.396.1

Bramley, E. N., **Some comparative directional measurements on short radio waves over different transmission paths.** *Institution of Electrical Engineers, London, Proceedings, Ser. B.*, 102(4):544-549, July 1955. 3 figs., 2 tables, 6 refs., 16 eqs. DWB—From observations of transmissions on 5-8 Mc/s from Aberdeen to Winkfield, entirely over land, and Hemsby, mainly over sea, it is concluded that correlation of closely corresponding components of F layer tilt is generally negligible. A daily variation of tilt approximately E-W occurs at about  $0.2^\circ/\text{hr}$ . On second order F layer transmissions over 700 km the land acts as a rougher reflector increasing the rapid directional fluctuations of the echo but not the total bearing variance mainly caused by ionospheric tilts. *Subject Headings:* 1. Radio wave propagation 2. Ionospheric tilt.—*C.E.P.B.*

7.2-125

551.510.535:550.38:523.74:621.396.1

Humby, A. M.; Minnis, C. M. and Hitchcock, R. J., **Performance characteristics of high frequency radiotelegraph circuits.** *Institution of Electrical Engineers, London, Proceedings, Ser. B.*, 102(4):513-522, July 1955. 21 figs., table, 8 refs. DWB—Operational data from several important long-distance radiotelegraph circuits have been analyzed and the results discussed in relation to variations in solar and magnetic activity. It is shown that the lowest operational efficiency on radio circuits need not necessarily occur at the same time as the lowest level of solar activity. For example, in 1952 the performance of many difficult radio circuits deteriorated considerably, coincident with a peak of magnetic activity, but subsequently recovered although solar activity continued to fall. On certain circuits there is a pronounced seasonal asymmetry of performance in the two directions of the route; to confirm that this is due to propagation effects, data from different organizations operating on substantially the same radio path are compared—particular reference being made to the United Kingdom-South Africa and the United Kingdom-Australia circuits. Suggestions are put forward as to the possible reasons for this asymmetry with season, and consideration is given to effects such as ionospheric propagation, atmospheric noise and the path taken by the rays. Mention is also made of other propagation phenomena, such as echo signals, maximum latitude of ray path and M reflections, which have a bearing on the operation of radiotelegraph circuits. For the purposes of the paper all references to seasons relate to the Northern Hemisphere. *Subject Headings:* 1. Radio wave propagation 2. Geomagnetic effects 3. Solar radio effects —*Authors' abstract.*

7.2-126

551.510.535:551.590.24

Minnis, C. M., **Electron production and recombination in the E-layer.** *Journal of Atmospheric and Terrestrial Physics, London*, 7(3):172, Sept. 1955. ref. DWB—Referring to MINNIS (see 6D-282, April 1955, *MAB*), values of electron production quoted as lower limits are in fact upper limits. *Subject Headings:* 1. Ionospheric variations 2. Eclipse phenomena —*C.E.P.B.*

## MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: **Application of vorticity charts** (Sanders, Kessler), 7.2-104; **Thunderstorm structure** (Penn), 7.2-145.

7.2-127

551.511

Bryson, Reid A. (*Met. Dept., Wisc. Univ.*), **Convective heat transfer with light winds.** *American Geophysical Union, Transactions*, 36(2):209-212, April 1955. 2 figs., 3 refs., 11 eqs. MH-BH—Cells of rising air were made visible over peat soil and lakes (near Univ. of Wisconsin) by virtue of steam fog on nearly calm cloudless days when insolation was strong. The slowly drifting cells were circular, like inverted funnels, and rotated in clockwise or counterclockwise direction, having sharp edged boundaries in the lower 2 m, but owing to accelerated vertical

motion and mixing, having poorly defined edges above that height. From observations made on the University Marsh Farm at Madison, a formula was derived which gave sensible heat flux on May 28, 1952 of .154 g cal/cm<sup>2</sup> min compared to .152 g cal computed from data from 1030h to 1430h. The temperature distribution was clearly bi-modal. The average temperature was 0.89°C higher at 33 cm than in environment. Air temperature was 287°K and average lapse rate .0135°C/cm. *Subject Headings:* 1. Convective cells 2. Convective heat transfer 3. Marsh Farm, Madison, Wisc.—M.R.

7.2-128

551.511

Martin, Frank L., **Generalization of constant absolute vorticity trajectories.** U. S. Naval Postgraduate School, Research Paper, No. 7, Feb. 15, 1955. 30 p. 8 figs., 12 refs., 59 eqs. **DWB**—Previous studies of constant absolute vorticity (C.A.V.) trajectories have imposed the following limitations: 1) zero lateral shear, 2) the trajectory is initiated from an inflexion, 3) the flow is steady-state. Limitation 1 may be generalized to constant lateral shear. Limitation 2 may be removed for both the plane and spherical trajectories. Limitation 3 is removed by an objective-type technique. The effect of lateral shear which varies along the trajectory is then considered, together with a quasi-geostrophic method of measuring it. *Subject Heading:* 1. Constant absolute vorticity trajectories.—*Author's abstract.*

7.2-129

551.511:538.1

Piddington, J. H., **Hydromagnetic waves in ionized gas.** *Nature*, London, 176(4480):508, Sept. 10, 1955. 7 refs., eq. **DWB**—An equation for weak disturbances in anisotropically conducting media is given. Three hydromagnetic waves are distinguished, ordinary (O) and extraordinary (E) corresponding to radio waves, and one resembling a sound wave (S). Their properties, which depend on relative intensity of "magnetic pressure" and gas pressure, are described. *Subject Heading:* 1. Magneto-hydrodynamic waves.—C.E.P.B.

7.2-130

551.511:551.551

Sakali, L. I., **O godovom khode koeffitsienta turbulentnosti.** [Annual variations of the turbulence coefficient.] *Meteorologiya i Gidrologiya*, No. 2:18-21, March/April 1955. 2 figs., 4 refs., eq. **DLC**—The annual variation of the coefficient of turbulence was calculated for 131 clear days, on the basis of the fixed meteorological observations of the Odessa Agro-meteorological Station for the period 1945-1951. The coefficient of turbulence was determined by means of the formula of M. I. BUDYKO which is best for convective conditions and by that of L. F. SHCHERBAKOVA (see 5.9-125, Sept. 1954, *MAB*) for deep inversions. At the boundary layer the coefficient of turbulence was calculated by the formula of D. L. LAIKHTMAN. The calculated values are represented in graphs and tables. *Subject Headings:* 1. Turbulence coefficient 2. Turbulent exchange.—I.L.D.

7.2-131

551.511

§Spar, J.; Fisher, Edwin L.; Paroczay, Ernest and Peterson, Roy E. (N. Y. Univ.), **Evaluation of terms in the vorticity equation, Preliminary results for 500 mb.** N. Y. Univ. College of Engineering, Research Division. Dept. of Meteorology and Oceanography, Contract Nonr-285(09), Progress Report, No. 1, Feb. 1955. 8 figs. (incl. 5 synoptic charts), 7 tables. 11 refs., 20 eqs. **DWB**—The terms in the vorticity equation are evaluated at the 500 mb level by a trajectory method for a case of cyclogenesis in the eastern United States. The results indicate that only the horizontal advective contribution to the local vorticity change was evaluated with any success. The individual vorticity change, or vorticity development, was not accounted for by the measurements of the generative terms in the vorticity equation. *Subject Headings:* 1. Vorticity equations 2. Vorticity experiments.—*Authors' abstract.*

## GENERAL CIRCULATION

See also: Atmos. circulation anomalies (Wahl), 7.2-251.

7.2-132

551.513:551.515(99)

Lamb, H. H. and Britton, G. P., **General atmospheric circulation and weather variations in the Antarctic.** *Geographical Journal*, London, 121(3):334-349, Sept. 1955. 6 figs., 2 tables, 21 refs. **DWB**—Types of circulation in Antarctica are deep warm anticyclones, deep cold

depressions, mixed situations becoming cyclonic at higher levels, and travelling depressions off the coast with warm sectors aloft. Fronts with snow occur all over Antarctica in varying frequencies (map). Daily frequencies of depressions and anticyclonic centers are plotted, the latter favoring 80°S over E. Antarctica (60–70% of the time). Months of extreme pressure are tabulated. A map of mean annual pressure in the S. Hemisphere is given and the seasonal variations indicated. The ratios of E/W and N/S winds in 60–70°S and wind directions and forces over the coast and plateau are shown. The account ends with a brief discussion of the effect of topography on the winds. *Subject Headings:* 1. Atmospheric circulation 2. Atmospheric disturbances 3. Antarctica.—C.E.P.B.

7.2-133

551.513.1:551.542.1:551.552

Hollmann, G., *Über die Beziehung zwischen Wind- und Druckfeld in Abhängigkeit vom der geographischen Breite.* [On the relation between wind and pressure fields depending on the geographical latitude.] *Meteorologische Rundschau*, 8(5/6):79–82, May/June 1955. 4 figs., 14 refs., 14 eqs. **MH-BH**—The influence of the latitude dependence of the Coriolis parameter on the deviation from the geostrophic wind (effect of latitude adaptation) is briefly described. With meridional air movement the latitude adaptation shows an ageostrophic zonal component which is always directed eastwards, first becoming considerable in very low latitudes. A connection with the equatorial westerlies is suspected. For two-dimensional divergence-free flow a solution to the flow functions (*neamtan*) of the associated pressure field is calculated from the barotropic vorticity equation, and set out with the flow function for different latitudes in order to show the decrease of the effect of the earth's rotation with approach to the equator. *Subject Headings:* 1. Atmospheric circulation 2. Pressure field 3. Wind fields.—*Transl. of author's abstract.*

7.2-134

551.513.2:551.557:629.13

Grover, J. H. H., *Operational aspects of jet-streams.* *Aeronautics*, London, 32(5):102–105, June 1955. 5 figs. **DWB**—The history of the discovery of the jet stream is set out beginning 1917. The form of the jet stream as part of the westerlies is described, with explanation by temperature differences near the tropopause and association with fronts in the troposphere. Clouds and clear air turbulence are described. Techniques of using or avoiding the jet stream in aircraft navigation are summarized. *Subject Headings:* 1. Jet stream 2. Aerial navigation.—C.E.P.B.

7.2-135

551.513.2:551.553.21:551.557

Ramanathan, K. R. (*Physical Res. Lab., Ahmedabad, India*), *On upper tropospheric easterlies and the travel of monsoon and post-monsoon storms and depressions.* (In UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, *Proceedings*, pub. 1955. pp. 243–244.) **DWB**—Aerological studies carried out from extensive networks of upper air stations particularly in North America and Europe have shown that the cyclones of middle latitudes are intimately connected with the undulations of the planetary westerly circulation and enabled us to trace the connection between the cyclonic vortices in the lower levels and wave-disturbances in the upper levels. But our information regarding high level winds in the upper atmosphere over the tropics is yet too scanty. From the observations that are available from Southeast Asia, North America, the Pacific and Australia, it is now clear that there is an easterly planetary circulation over the tropics and that waves form in this planetary stream. Indian meteorologists found in the high troposphere the easterly jet stream with a speed of 90 knots in July and August over India. Examples of tracks of cyclonic storms which crossed over from the China Seas across Indochina, Thailand and Burma from the east and regenerated in the Bay of Bengal are numerous. During the monsoon months there occurs a succession of weather disturbances in the upper air moving one after another from the east across South Asia, and these, when they combine with an inflow of moist air from south of the equator, develop into cyclonic storms of great extent but of feeble depth and contribute the major part of the rainfall of Burma, India, and Pakistan. It is most desirable to establish more radiosonde and radar-wind stations in the tropics. *Subject Headings:* 1. Easterly waves 2. General circulation 3. Aerological studies 4. Easterly jet stream 5. Cyclonic storms 6. Monsoons 7. India.—*Author's abstract.*

## ATMOSPHERIC DISTURBANCES

See also: Storm damage (Kerr), 7.2-3; Atmos. disturbances (Lamb, Britton), 7.2-132; Report on high cloud observation (Saito, Narikawa), 7.2-218; Frontal type precip. (Kamiko), 7.2-225.

7.2-136

551.515.2(759)

Bunting, Donald C. (*Dept. Physical Sci., Univ. of Fla.*), Comparison of six great Florida hurricanes. *Weatherwise*, 8(3):64-67, 78-79, 82, June 1955. diagr., tables, photos. DWB—Six of the 12 greatest hurricanes in 74 years of Florida history are charted and described, and damage and structure (radar photos) illustrated. Details of origin, path, rate of movement, lowest pressure over Florida, maximum winds, accompanying precipitation, storm waves, damage and loss of life, radius, gradient wind (extreme) and kinetic energy are tabulated and discussed. These six hurricanes occurred in 1926, 1928, 1929, 1944, 1947 and 1949. The lowest pressure was 27.43 in. at West Palm Beach Sept. 16, 1928. *Subject Headings:* 1. Hurricanes 2. Hurricane statistics 3. Florida.—M.R.

7.2-137

551.515.2(261)

Rodewald, M., Die Hurrikan-Saison 1954. [The hurricane season 1954.] *Wetterlotse*, No. 92:168-171, Sept. 1955. fig. DLC—The tracks of Carol, Dolly, Edna and Hazel are shown and the damage briefly described. Hazel gave a pressure of 938 mb. *Subject Headings:* 1. Hurricanes 2. North Atlantic.—C.E.P.B.

7.2-138

551.515.2:551.501.7:551.507.352

Sherman, Leon and LaSeur, Noel E. (*both, Florida St. Univ., Tallahassee*), Reconnaissance of the "complete hurricane." *American Meteorological Society, Bulletin*, 36(4):152-158, April 1955. 6 figs., table, 7 refs. DWB—The need for locating the hyperbolic point as well as the "eye" of a hurricane is stressed and the kinematic need for a hyperbolic point is analyzed in terms of the wind field of a cyclonic system. The location of hyperbolic points from a plane over the ocean without interference with the requirement of "eye" location is discussed and the observations obtained from flights into the hurricanes Carol, Dolly and Edna during Aug.-Sept. 1954 to the regions of the hyperbolic points are described. *Subject Headings:* 1. Hyperbolic point of hurricane 2. Eye of hurricane 3. Hurricane reconnaissance.—I.L.D.

7.2-139

551.515.2

Some weather wonders. *Senior Scholastic*, 66:35, Feb. 9, 1955. Offset reproduction of prepared sheets. DWB—Summary of meeting at New York City in Jan. 1955 wherein AMIAS predicted that changing patterns of hurricanes and general circulation are possibly in progress. *Subject Headings:* 1. Hurricane tracks 2. Climatic variations. I. Namias, Jerome E.—M.R.

7.2-140

551.515.21

Namekawa, T. and Aoki, S. (*both, Dept. of Met., Kyoto Univ., Kyoto, and Nara Weather Station, Nara, Japan*), On the structure of the disastrous typhoon hitting the Japanese Islands. A summary note on Namekawa's theory of main and secondary typhoons. (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9-12, 1954, *Proceedings*, pub. 1955. p. 55-50. 11 figs., eqs.) DWB—The authors present further theoretical evidence for the conclusion that a disastrous typhoon such as the Muroto-Typhoon, which appears on weather charts as one huge cyclonic pattern, actually consists of a primary cyclonic pattern, called the "main typhoon" and secondary cyclonic patterns, termed the "secondary" and the superposed pressure field of those two patterns has the appearance of a single cyclonic pattern. *Subject Headings:* 1. Typhoon structure 2. Japan.—I.L.D.

7.2-141

551.515.23

Wang, Griffith (*Civil Air Transport, Taipei, Formosa*), Development and movement of typhoons. (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9-12, 1954, *Proceedings*, pub. 1955. p. 165-174. 11 figs.) DWB—A subjective study of typhoons is made and it is concluded that typhoons develop when polar troughs move into a position such as to induce

broad convergence and divergence fields in the vicinity of cyclone eddies. Subjective results are presented for the steering and recurving of typhoons. *Subject Headings: 1. Typhoon movement 2. Typhoon formation.—Author's abstract.*

7.2-142

551.515.3(74)

Brooks, John, Reporter at large. Five-ten on a sticky June day. *New Yorker*, N. Y. 31(15):39-69, May 28, 1955. DLC—A vivid but accurate report on the nature of tornadoes with special regard to the Worcester, Mass., tornado of June 9, 1953 when 90 people were killed and 436 injured seriously. The failure to forecast the tornado, in spite of signs which indicated such violent storms were probable in the area, is attributed to the fact that such disaster had never occurred before in historical times, so the forecasters did not want to unduly alarm the public. Furthermore, no indication of the disaster reached the Weather Bureau on teletype circuits until over an hour after the tornado struck Worcester. The report was compiled from interviews with numerous officials and individuals in and outside the disaster area. *Subject Headings: 1. Tornado, Worcester, Mass. (June 1953) 2. Tornado statistics 3. Worcester, Mass.—M.R.*

7.2-143

551.515.3(4)

Kohlbach, W., Die Westharztrömbe vom 4. Mai 1952. [The West Harz tornado of May 4, 1952.] *Meteorologische Rundschau*, 8(5/6):90-92, May/June 1955. 5 figs., 9 refs. MH-BH—The tornado did great damage to forests in N.W. Germany. The track was in two stretches of 13 and 16 km on the same line, with a gap of 18 km. Speed was 35 km/hr to NNE. The fall of the trees was mainly in the direction of the track, with lines of convergence and divergence. Upper air conditions are discussed. Precipitation was of thunderstorm type. *Subject Headings: 1. Tornadoes 2. Germany.—C.E.P.B.*

7.2-144

551.515.3:551.576.1(4)

Pestell, E. and Smith, C. V., Funnel cloud at Luton, June 8, 1955. *Meteorological Magazine*, London, 84(999):289-290, Sept. 1955. photo. Also Funnel cloud at Luton Airport. *Weather*, 10(10):328, Oct. 1955. photo. DWB—Photo of a rotating funnel formed by amalgamation of two clouds at 800-1000 ft, extending to the ground. *Subject Headings: 1. Funnel clouds 2. Luton, England.—C.E.P.B.*

7.2-145

551.515.41:551.511(4)

\*Penn, Samuel (U. S. W. B., Boston), A possible high-level thunderstorm mechanism. the case of August 20, 1951 over New England. *American Meteorological Society, Bulletin*, 36(6):278-288, June 1955. 17 figs. (incl. photos), eq. DLC, DWB—An explanation offered for a case of violent and prolonged non-frontal thunderstorms in New England. The thunderstorms occurred in the vicinity of an upper level trough. An analysis of the saturation points to the development of marked divergence in the upper troposphere and convergence at middle levels. The resulting vertical motions acted to decrease the stability of the air mass. The increased divergence-convergence aloft resulted from an intensification of the ridge to the west and not from any deepening of the trough in the thunderstorm area. *Subject Headings: 1. Thunderstorm structure 2. Instability 3. New England.—Author's abstract.*

## RADIATION AND TEMPERATURE

### RADIATION

See also: Weather forecasts (Abbot), 7.2-105; Long range precip. forecasting (Abbot), 7.2-106; Auroral activity in middle lat. (Vassy), 7.2-281; special bibliography on Climate of Enclosed Spaces, p. 211.

7.2-146

551.521:551.525:551.584

Ambach, W., Über den nächtlichen Wärmeumsatz der gefrorenen Gletscheroberfläche. [On the nocturnal temperature reversal on the frozen glacier surface.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):411-426, 1955. 4 figs., 4 tables, 12 refs., 25 eqs. German, English and French summaries p. 411-412. DWB—Measurements

on a boring in the Vernagtferner glacier (about 3000 m) on 7 clear and cloudy nights in July-Aug. gave curves of fall of temperature at depths 0-12 cm. The effective outward radiation with different cloud amounts is calculated, but the loss of heat is largely masked by the freezing of melt water. The heat balance on frosty nights is calculated from effective radiation, conduction, latent heat and heat of freezing, as 12-14 cal/cm<sup>2</sup> compared with 9-11 observed. On cloudy frostless nights there is little cooling and some ablation. The change of temperature just after sunrise is also discussed; the delay of melting is attributed to absorption by the ice. *Subject Headings:* 1. Ice temperatures 2. Glacier heat balance 3. Nocturnal temperature inversion.—C.E.P.B.

7.2-147

551.521

**Radiative balance in the atmosphere:** Royal Society discussion [June 9, 1955]. *Nature*, London, 176(4483):635-636, Oct. 1, 1955. DWB—H. S. W. MASSEY, who opened discussion, indicated the importance of absorption, emission and scattering and the temperature and pressure distribution in the atmosphere. F. MÖLLER discussed latitude differences in heating and cooling in the atmosphere and cooling by cloud in Germany. A. R. CURTIS and R. M. GOODY described computations on radiative heating and thermal cooling, and M. V. MIGEOTTE reviewed spectroscopic investigations of minor atmospheric constituents. G. D. ROBINSON referred to observations of solar and terrestrial radiation and the radiative balance at Kew, and the work of the International Geophysical Year. Several papers dealt with measurements of radiant intensities, water vapor and ozone by high altitude flights. D. R. BATES discussed temperatures above 200 km, R. L. F. BOYD the solar spectrum and R. W. DITCHBURN absorption of UV radiation by atmospheric gases. *Subject Heading:* 1. Radiation balance.—C.E.P.B.

7.2-148

551.521.1:621.47

**Conquest of solar energy.** *Current Science*, Bangalore, India, 24(2):42, Feb. 1955. DWB—Use of huge paraboloid mirrors to harness solar energy in the Tashkent region was reported by V. A. BAREM (head of the Heliotechnical Laboratory at the G. M. Krzhizhanovsky Power Institute at Tashkent) at a UNESCO and National Institute of Sciences symposium on use of waste energy in arid zones. Solar kitchens, solar stills for producing fresh water from salt, solar heaters for canneries, and solar steam plants are reported to be accomplished facts. *Subject Headings:* 1. Solar energy utilization 2. Tashkent Heliotechnical Institute 3. Tashkent, U.S.S.R. I. Baum, V. A.—M.R.

7.2-149

551.521.1:621.47

Degen, Heinz, *Kraftreserve Nr. 1: Die Sonnenenergie*. [Power reserve No. 1: solar energy.] *Naturwissenschaftliche Rundschau*, 8(10):403, Oct. 1955. DWB—Description of solar engines and air-conditioning units at Tashkent Heliotechnical Institute. These have great possibilities for use in arid regions. *Subject Headings:* 1. Solar generators 2. Tashkent Heliotechnical Institute 3. Tashkent, U.S.S.R.—C.E.P.B.

7.2-150

551.521.1

Sauberer, F., *Zur Abschätzung der Globalstrahlung in verschiedenen Höhenstufen der Ostalpen*. [Evaluation of global radiation at different elevations of the Eastern Alps.] *Wetter und Leben*, Vienna, 7(1/2):22-29, 1955. 5 tables, 11 refs. DWB—Approximate factors for estimating the global radiation (sun and sky) incident upon a horizontal surface are presented. All data refer to points with moderately high horizons between 47 and 47.5°N lat. The paper contains factors for calculating the daily totals, a monthly total of solar radiation for cloudless days, mean daily variation of sky radiation for cloudless days for the fifteenth day of each month, daily variations of global radiation, sky radiation for cloudy days for the fifteenth day of each month, daily variation of global radiation for a cloudless sky for the fifteenth day of each month, and daily totals of global radiation for the fifteenth day of each month for various degrees of cloudiness. The radiation values are for elevations of 200 m, 1000 m, 2000 m and 3000 m and are expressed in m cal/cm<sup>2</sup>min. *Subject Headings:* 1. Global radiation 2. Sky radiation 3. Global radiation calculation 4. Eastern Alps.—I.L.D.

7.2-151

551.521.13

\*Stoll, Alice M. and Hardy, James D., **Thermal radiation measurements in summer and winter Alaskan climates.** *American Geophysical Union, Transactions*, 36(2):213-226, April 1955. 10 figs., 8 tables, 7 refs., 6 eqs. **MH-BH**—Thermal characteristics of the summer and winter Alaskan climates were evaluated by two methods using data from Fairbanks and Nome: (1) direct measurement of solar and low-temperature radiation exchange by means of the *panradiometer* (an absolute radiation-measuring device described briefly) and by computation from the measured values, the mean radiant temperature of the environment; and (2) the direct measurement of the mean radiant temperature of the environment with a *thermoradiometer* (instrument and method of use also described briefly) and by computation from these measurements, the solar contribution to the total radiation. During the summer period, the solar radiant flux occasionally exceeded 800 kg cal/m<sup>2</sup> hr. The mean radiant temperature of the environment varied from 8°C to 51°C undergoing large and sometimes rapid changes as the intensity of solar radiation varied with sky cover. During the winter period, the solar radiation attained only 10 to 30% of the summer intensity. The mean radiant temperature varied from -3°C to -55°C and depended strongly on the radiant temperature of the sky, a concept introduced for simplification of the radiation-exchange problem. The latter temperature was greatly influenced by the water vapor content of the atmosphere. Effect of ice-fog and snow cover on radiant temperatures discussed and data presented in tables and graphs. *Subject Headings*: 1. **Panradiometer measurements** 2. **Thermo-radiation measurements** 3. **Radiation climate of Alaska** 4. **Ice fog** 5. **Fairbanks, Alaska** 6. **Nome, Alaska.**—*Authors' abstract.*

7.2-152

551.521.13:511

Abbot, Charles Greeley, **Periodic solar variation.** *Smithsonian Miscellaneous Collection*, Wash., D. C., 128(4), June 14, 1955. 20 p. 5 figs., 3 tables, 3 refs. **DLC**—The method of calculating periodicities in the solar constant as aliquot parts of 273 months is described. Several of these are found also in daily pulse rates. A list of 64 periods ranging from 4.07 to 273 months in the solar constant is given, with ranges and the corresponding periods in St. Louis rainfall. Of these, 31 are combined for 1923-35, and compared with 10-day means of the observed constant. Agreement is good (correlation 0.90) except in 1924 and 1925. *Subject Heading*: 1. **Solar constant periodicities.**—*C.E.P.B.*

7.2-153

551.521.16:551.593

Scheer, Georg, **Über Messungen der Dämmerungshelligkeit auf einigen Inseln im Atlantik und Pazifik.** [On measurements of the brightness of twilight on some islands in the Atlantic and Pacific.] *Meteorologische Rundschau*, 8(5/6):82-85, May/June 1955. 2 figs., table, 3 refs. **MH-BH**—Brightness measurements with a recording photometer were made at Ponta Delgada (Azores), Bonaire (Caribbean) and Galapagos Islands. Illumination on a horizontal surface for sun height -12 to +3° with different cloud amounts is tabulated for these islands and for Frankfurt a.M. and Darmstadt. For cloud 1-3 tenths, brightness is above cloudless sky, for 4-10 increasingly below. On Bonaire and Galapagos it ranged from 0.01 lux at -12° to over 1000 at +2°, slightly less at mountainous Ponta Delgada and much less at Frankfurt. Causes of high illumination on island coasts are discussed. *Subject Heading*: 1. **Twilight sky brightness.**—*C.E.P.B.*

7.2-154

551.521.3:536

King, Jean I. F. (*U. S. A. F. Cambridge Res. Center, Mass.*), **Radiative equilibrium of line-absorbing atmosphere, Pt. 1.** *Astrophysical Journal*, Chicago, 121(3):711-719, March 1955. 2 figs., 3 tables, 3 refs., 39 eqs. **DLC**—The radiative-transfer theory for band-absorbing semi-infinite atmospheres possessing line structure is developed by extending the formalism of CHANDRASEKHAR to an integration over frequency space as well as over  $\mu = \cos \theta$  space. The generalized Hopf-Bronstein relation which results is independent of the detailed line structure and is a function solely of the grayness parameter  $\bar{\lambda}$ , the square-root product of the arithmetic and harmonic means of the absorption coefficient. The effect of line structure on equilibrium configurations and limb darkening is obtained by using the Elsasser band model which conveniently incorporates deviations from grayness in a single parameter,  $\beta$ . *Subject*

**Headings:** 1. Radiative equilibrium 2. Line absorption 3. Long wave absorption — *Author's abstract.*

7.2-155

551.521.31:551.593.7:550.38

Barber, D. R., **Changes in brightness, polarization, and colour of the zenith day sky accompanying geomagnetic activity.** *Journal of Atmospheric and Terrestrial Physics*, London, 7(3):170-172, Sept. 1955. table, 2 refs. **DWB**—Sky brightness and polarization near the zenith were measured on bands around 4800 and 6200 Å, reduced to air-mass 2 and compared with magnetic disturbance K. They show a systematic increase of zenith brightness with increasing K. Polarization of additional scattered light (probably by large high-level particles) with high K decreased in blue light and increased in red light. Measurements of this type can be a sensitive index of geomagnetic conditions. *Subject Headings:* 1. Sky brightness 2. Polarization 3. Geomagnetic activity.—*C.E.P.B.*

7.2-156

551.521.4:551.578.46

Hubley, Richard C., **Measurements of diurnal variations in snow albedo on Lemon Creek Glacier, Alaska.** *Journal of Glaciology*, 2(18):560-563, Oct. 1955. 2 figs., 6 refs. English and German summaries p. 560. **DWB**—Summer measurements of incoming and reflected solar radiation were made with Eppley pyrhelimeters on Lemon Creek Glacier, Alaska. On clear days albedo varied from nearly .9 (morning) and .82 (afternoon) to about .65 from 9-15 h. On cloudy days albedo near midday was .75 to .8, varying inversely with height of cloud layers. Dry powdery snow is a diffuse reflector nearly independent of solar angle, but recrystallization of old snow introduces specular reflection. *Subject Headings:* 1. Albedo of snow 2. Lemon Creek Glacier, Alaska.—*C.E.P.B.*

7.2-157

551.521.4

†Seaton, M. J. (*Inst. d'Astroph., Paris*), **Theories of the airglow spectrum.** *Annales de Géophysique*, Paris, 11(2):232-248, April/June 1955. 3 tables, 68 refs., 24 eqs. **DLC**—Certain salient observational results are summarized. The problem of the heights of the emitting layers is discussed and it is concluded that, with the possible exception of the [O I] red lines, it is difficult to accept that the emission heights could be appreciably greater than 100 km. For OH, Na and the O<sub>2</sub> atmospheric band heights appreciably less than 100 km seem by far the most plausible. The following theories are discussed: A) chemical energy sources (molecular recombination following photodissociation); B) recombination of charged particles in the ionized layers; C) excitation by incoming particles and D) conversion of atmospheric kinetic energy to radiant energy. It is concluded that theory A is by far the most plausible but that theory B may account for at least part of the [O I] red line intensity. It is considered that, for small solar depression angles, the twilight enhancement of the [O I] red lines is mainly due to resonance but that other processes are responsible for the enhancement at larger depression angles. It is considered improbable that the twilight emission of [N I] -5199 is due to resonant excitation. *Subject Heading:* 1. Airglow spectrum theories.—*Author's abstract.*

7.2-158

551.521.61:535.33 551.508.21

Sloan, Raymond; Shaw, John H. and Williams, Dudley, (all, *Ohio State Univ., Dept. of Physics and Astron.*), **Infrared emission spectrum of the atmosphere.** *Optical Society of America, New York, Journal*, 45(6):455-460, June 1955. 4 figs., 8 refs. **DLC**—A device for the convenient quantitative measurement of the thermal radiation from the atmosphere has been developed. In the instrument the emission spectrum of the earth's atmosphere as observed at ground level is compared automatically with a spectrum approximating that of a blackbody at the boiling point of liquid nitrogen at atmospheric pressure. The most prominent features of the atmospheric spectrum between 4μ and 15.5μ, observed during daylight and darkness when the sky is clear, are due to emission by carbon dioxide, ozone, and water vapor; the intensity of the water vapor emission shows pronounced variations with atmospheric temperature and humidity. The spectrum of an overcast sky resembles that of a blackbody. By comparing the recorder traces of the atmospheric spectra with similar traces obtained with blackbody source, it is possible to estimate the effective radiation temperature of various

portions of the sky for various atmospheric conditions. *Subject Headings:* 1. Infrared spectra 2. Emission spectra 3. Blackbody radiation 4. Infrared radiation instruments.—*Authors' abstract.*

## TEMPERATURE

See also: Frost charting (Winter), 7.2-84; Evaporation measurement (Glazova, Laikhtman), 7.2-92; Anti-frost smoke devices (Sauberer), 7.2-111; special bibliography on Climate of Enclosed Spaces, p. 211.

7.2-159

551.524:581.9(4)

Jeffree, E. P., *Temperature-ranges and distributions of some vascular plants.* *Nature* London, 176(4484):703-704, Oct. 8, 1955. 2 figs., 8 refs. DWB—Examples of actual July, Aug. or Jan. temperatures as limits for plants in the British Isles are quoted. A formula  $(\gamma_2 - \gamma_1)^2(a_2 - a_1)^2$ , where  $a_1$ ,  $a_2$ ,  $\gamma_1$ ,  $\gamma_2$  are lower and upper limits of Jan. and July actual temperatures (different for each plant) gave isolines which fitted the observed distribution of 41 plants in Europe fairly well. *Subject Headings:* 1. Temperature effects 2. Plant distribution 3. Europe.—C.E.P.B.

7.2-160

551.524.3(43)

Teich, M., *Die Witterungsentwicklung nach kalten Hochwintern.* [The weather development after cold mid-winters.] *Zeitschrift für Meteorologie*, 9(7):202-210, July 1955. 5 figs., 4 tables, 9 refs. DWB—The frequencies of 5 different weather types (3-day running means) for Jan.-May 1881-1954 in central Europe for 19 severe winters and for all years are plotted. Significance tests (*t*-test) showed that most of the peaks and troughs are not significant and are useless for forecasting. The frequency of cold pentads following 16 cold winters in Karlsruhe (1887-1937) is only significantly great in March 2-21. Finally, monthly temperatures in central Europe following 36 cold winters (1768-1954) shows persistence of the cold only in March. *Subject Headings:* 1. Springs following severe winters 2. Germany.—C.E.P.B.

7.2-161

551.524.31:525.62

Haurwitz, V. and Möller, F., *The semidiurnal air-temperature variation and the solar tide.* *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):332-350, 1955. fig., 5 tables, 14 refs., 21 eqs. English, German and French summaries p. 332-335. DWB—The oscillation is made up of a wave travelling from E to W ( $W_2$ ) attributed to the semidiurnal temperature oscillation, and a standing wave with zonal symmetry ( $Z_2$ ) due to the distribution of land, assuming zero temperature amplitude over the sea. Pt. 3 discusses the thermal excitation and resonance magnification of  $Z_2$  and  $W_2$ . It is shown that the form of  $Z_2$  is such as would be expected from the resonance theory, including a term which is antisymmetrical to the equator because of the differences in land and water distribution of the Northern and Southern Hemispheres. Another large antisymmetrical term in the migrating diurnal temperature wave does not appear in  $W_2$  because of unfavorable resonance conditions. These results support the resonance theory of the atmospheric tides. *Subject Headings:* 1. Semidiurnal pressure waves 2. Semidiurnal temperature waves.—C.E.P.B., *Authors' abstract.*

7.2-162

551.524.34:551.506.3(471.1)

\*Keränen, J. (Helsinki), *Die Temperaturschwankungen in Finland seit dem Jahre 1830* [Temperature variations in Finland since 1830.] *Berlin. Freie Universität. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(4):25-38, 1955. 5 figs., 7 tables, 12 refs. DWB—Finland's temperatures, as deduced from records at Helsinki (1828-1950), Oulu (1846-1950) and 9 other stations, have been improving markedly since around 1900 though month-to-month variations are noted. Graphs show actual variations. The harvest have also improved and good harvests are obtained much further north. Comparison of 1934-1938, the warmest 5-year period, with 1900-1930 normals show that warming of 1° to 3°C has occurred in every season of the year. Since 1940 there has been a slight reversal. *Subject Headings:* 1. Temperature trends 2. Warming of Arctic 3. Long period record 4. Cereal cultivation in Arctic 5. Helsinki, Finland 6. Finland.—M.R.

7.2-163

551.524.36:551.555.6

Bochet, R. and Frasse, M., **Les froids exceptionnels sur le littoral Algérois.** [Exceptional cold on the Algerian coast.] *La Météorologie*, 4th Ser., No. 35:267-286, July/Sept. 1954. 8 figs., 6 tables, 2 refs., eq. French, English and Italian summaries p. 267. DWB—A cold wave on Jan. 5, 1953 brought a mean daily temperature as low as  $4.2^{\circ}\text{C}$  [ $3^{\circ}$  below lowest mean daily Jan. temperature on record (9 years)] at Maison-Blanche. At Algiers Univ. the mean daily temperature on Jan. 5, was  $5.1^{\circ}\text{C}$ . Hail and ice fell on the 3 preceding days. Cold waves in other years (Jan. 28, 1935, Dec. 28, 1917 and Jan. 18, 1891) are discussed and data given. The sensation of cold on Jan. 5, 1953 was due more to cloudiness and low maxima than to low minima, for other (sunny) days the same month were colder in the early morning but warmer in the daytime. *Subject Headings:* 1. Cold waves 2. Maison-Blanche, Algeria 3. Algeria.—M.R.

7.2-164

551.524.36(512.317)

Hughes, R. G., **Unusually low temperatures in Hong Kong.** *Meteorological Magazine*, London, 84(999):288, Sept. 1955. DWB—Jan. 11-12, 1955, record minimum air temperature of  $26.5^{\circ}\text{F}$  at R.A.F. station Sek Kong in a narrow valley. On Jan. 10-11 minimum at the Observatory was  $37.6^{\circ}\text{F}$ , the lowest for 55 years. *Subject Headings:* 1. Temperature extremes 2. Hong Kong.—C.E.P.B.

7.2-165

551.524.4(83):551.525.6 551.524.2(83)

Almeyeda Arroyo, Elías, **Chilean temperature anomalies.** *Geographical Review*, N. Y., 45(3):419-422, July 1955. fig. DWB, DLC—As a result of the cold Peru Current, temperatures increase with elevation up to 1000 to 1500 m in broad level tracts as wells as in valleys. Reduction to sea level by applying the normal lapse rate of  $1^{\circ}\text{C}$  for 300 m of altitude is used in drawing isotherms. Maps showing annual Jan. and July isotherms for Chile are reproduced. The effect of the Peru Current upon the temperature regime is discussed. *Subject Headings:* 1. Temperature anomalies 2. Temperature distribution 3. Peru Current 4. Chile.—I.L.D.

7.2-166

551.524.7(43) 551.547(43)

\*Holzapfel, Rupert and Manig, Marianne, **Zum mittleren täglichen Gang von Temperatur und Druck in der freien Atmosphäre über Deutschland.** [On the mean daily variation of temperature and pressure in the free atmosphere over Germany.] *Meteorologische Rundschau*, 8(5/6):85-88, May/June 1955. 2 figs., 2 tables, ref. MH-BH—Seasonal means of temperature and pressure at 3, 9, 15 and 21 h for 1949-53 are given for Berlin and Munich, ground -14 km, and discussed. In the stratosphere a diurnal range  $>1^{\circ}\text{C}$  is found in summer but not in winter. Cloud decreases range up to 10 km, especially in winter. *Subject Headings:* 1. Upper air pressure 2. Upper air temperatures 3. Germany.—C.E.P.B.

7.2-167

551.524.7

\*Neumann, J., **Latitudinal variation of tropospheric temperature lapse rate.** *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, Vienna, 8(4):351-353, 1955. table, 5 refs., 3 eqs. English, German and French summaries p. 351. DWB—Table gives for lat.  $0^{\circ}$ ,  $10^{\circ}$  . . .  $70^{\circ}\text{N}$  for Jan. and July the mean surface and troposphere temperatures, height of tropopause and lapse rate  $\beta$  in  $^{\circ}\text{C}/\text{km}$ .  $\beta$  is represented by  $\beta\phi = 6.25 - 2 \sin^2\phi$  and is extended to  $\phi = 90^{\circ}$  on this basis. The average for the Northern Hemisphere is  $5.85^{\circ}\text{C}/\text{km}$ . *Subject Headings:* 1. Vertical temperature gradient 2. Tropospheric temperatures.—C.E.P.B.

## SOIL TEMPERATURE

See also: Nocturnal temp. inversion (Amibach), 7.2-146; Temp. anomalies (Almeyeda Arroyo), 7.2-165.

7.2-168

551.525(422)

Whiten, A. J., **Soil temperatures at two feet.** *Weather*, 10(10):326-328, Oct. 1955. fig., 2 refs. DWB—Tap-water temperatures (5-day means) for 1948-49 and 1954 at Worcester Park, Surrey, are plotted as representing soil temperatures at 2 ft. Possible influence by

rain percolating downwards is discussed. *Subject Headings:* 1. Soil temperature variations 2. Surrey, England.—C.E.P.B.

7.2-169

551.525.5:631

Maksimovich, G. A. and Gorbunova, K. A., *Merzlotnye bugry v Molotovskoi Oblasti* [Frost hummocks in the Molotov District.] *Priroda*, Moscow, 44(4):102-103, April 1955, 3 figs. **DLC**—Describes a series of frost hummocks (rectangular or round) about 7 m long, 3 m wide and 40 to 62 cm high, divided by furrows 20-30 cm wide, observed for the first time on the first terrace of the left bank of the Sylva River, Molotov District. The terrace is underlain by a 3-5 m thick layer of argillaceous or clayey soils resting on a sand and pebble foundation about 9 m thick. Investigations of the mounds and observations of seasonal changes occurring in them, carried out during the years 1943-1946, result in the following explanation of their origin: with the onset of freezing temperatures water moves along the capillaries to the upper layers of the ground where ice crystals, later lenses of ice, are formed. A series of frost cracks appear, breaking up the surface of the ground into individual mounds which expand gradually. The height of the hummock drops during the thaws, but the cracks remain and become furrows. The next year's freezing causes further growth of the hummock. Similar frost hummocks were found in 1951 in the vicinity of Molotov City. *Subject Headings:* 1. Frost hummocks 2. Frost heaving 3. Molotov District, U.S.S.R.—A.M.P.

## PRESSURE AND WIND

### PRESSURE

See also: **Topography** (Bartsch), 7.2-74; **Barometric tendency calculation** (Reuter), 7.2-103; **Pressure field** (Hollmann), 7.2-133; **Upper air pressure** (Holzapfel, Manig), 7.2-166; **Geostrophic & upper air winds** (Radok), 7.2-194; **Geostrophic wind approximation** (Treloar), 7.2-195; **Surface wind variations** (Sakai), 7.2-197.

7.2-170

551.541:623.4

\*Yamamoto, Ryoaburo, **Microbarographic oscillations produced by the explosions of hydrogen-bombs.** *Kyoto. Univ. Meteorological Research Institute, Meteorological Notes*, Ser. 2, No. 1, Nov. 1954. [14 p.] 8 figs., 4 tables, 5 refs. Reprint from *Kyoto. Institute for Chemical Research, Bulletin*, Nov. 1954, p. 120-133. Shorter version in *Weather*, 10(10):321-325, Oct. 1955. **DWB**—Microbarographic records obtained at tripartite storm microbarograph station at Shionomisaki in S. Central Japan on March 27, 1954, showed speeds similar to those from Krakatoa and Great Siberian meteor (1908) which speeds approach the speed of sound whereas those from storms travel at  $\frac{1}{10}$  to  $\frac{1}{2}$  that speed. Microbarographic records calculated at 30 other places in Japan also showed high velocities, and on Nov. 1, 1953, March 1, 1954, April 26, 1954 and May 5, 1954 showed similar characteristics. Map shows stations whose location, observers and instruments are described or listed. Characteristic microbarograms from Shionomisaki for 5 occasions noted above, indicate common origin as can be seen in reproductions—conclusion from speed and direction calculations is that the waves originated at Bikini. Speeds are slightly less than that of sound and increase in warm weather, whereas Krakatoa wave was nearer the speed of sound. The latter wave traveled around the earth several times, but no note of the H-bomb waves doing so could be detected. No seismic waves, such as occurred in both Krakatoa and Siberian meteor explosions, were detected. Mareograms (reproduced) did appear to show wave disturbances originating at Bikini, in all 5 cases. Periods of 2 min. followed by 1 min. waves were observed in both Siberian meteor and Shionomisaki records. These confirm theoretical points involving discontinuity at 40 km. *Subject Headings:* 1. Microbarograph oscillations 2. Explosion waves 3. Acoustical propagation 4. Great Siberian Meteor (1908) 5. Krakatoa eruption (1908) 6. Bikini H-bomb tests 1952-54 7. Shionomisaki, Japan.—M.R.

7.2-171

551.542:614.8

Akai, Seiko, **Great fires and meteorological conditions in Japan.** *Journal of Meteorological Research*, Tokyo, 6(8):323-332, Nov. 1954. 6 figs., 5 tables, 5 refs. In Japanese

English summary p. 323. **DWB**—The author investigated statistically the geographical and seasonal distributions of great fires in Japan from 1907 to 1951. In view of the studies described above, it can be suggested that conflagrations are closely connected with meteorological conditions, especially with pressure distribution. *Subject Headings: 1. Conflagrations 2. Pressure distribution 3. Japan.—Author's abstract.*

7.2-172

551.543:523.74

Berlage, H. P. (*Indonesia*), **Solar activity and air pressure fluctuations over the South Pacific Ocean.** *I.U.G.G. Association of Meteorology, Brussels, 1951, Procès-Verbaux des Séances, Mémoires et discussion*, pub. 1953. p. 107-112. fig., 2 eqs. **DWB**—The "Southern Oscillation" with four waves within each sunspot cycle, analyzed on the basis of pressure oscillations in the Easter Island High and the Malay Low and of temperature oscillations in the South Pacific, Southeast Asia and the tropical seas from Java to Australia. Rather complicated rules are listed to get a fair agreement with pressure fluctuations at Batavia. *Subject Headings: 1. Solar-pressure relationships 2. General circulation 3. South Pacific 4. Southeast Asia 5. Batavia.—A.A.*

7.2-173

551.543

Mosetti, F. and Mosetti, G., **Alcune componenti dell'oscillazione barometrica.** [Some components of pressure oscillations.] *Rivista di Meteorologia Aeronautica*, Rome, 14(3/4):33-39, July/Dec. 1954. 4 figs., 7 refs. **MH-BH**—Two barograms obtained during thunderstorms, and a third one obtained under normal conditions have been submitted to periodical analysis, in order to establish the behavior of their respective short period components. The normal barogram is shown to consist of few almost sinusoidal components, having a regular behavior and amplitude; in case of storms, the components appear on the contrary to take the form of more numerous and strongly damped impulse oscillations. The order of magnitude of the periods determined in this way coincides with that of the periods registered on barograms, in presence of perturbations. *Subject Headings: 1. Pressure oscillations 2. Barogram analysis.—Authors' abstract.*

## TURBULENCE

See also: **Wind & windmills** (Karmishin), 7.2-13; **Turbulent exchange** (Sakali), 7.2-130; **Turbulent diffusion** (Grigor'eva), 7.2-205.

7.2-174

551.551

Bhalotra, Y. P. R., **A case of severe clear-air turbulence over North India.** *Weather*, 10(10):329-330, Oct. 1955. fig., 2 refs. **DWB**—On April 7, 1953, heavy turbulence occurred at 36,000 to 38,000 ft between Allahabad and Pallam, associated with a deep thermal trough over N.W. India. Map shows 300-200 mb thickness. *Subject Headings: 1. Clear air turbulence 2. India.—C.E.P.B.*

7.2-175

551.551:532.517.4:629.13

Desoutter, D. M., **Boundary layers.** *Aeronautics*, London, 32(5):115-127, June 1955. 12 figs. **DLC**—Account of Boundary Layer Symposium at National Physical Laboratory, March 31-April 1, 1955. A number of papers are summarized, dealing with mathematics and physics of 2- and 3-dimensional flows and describing experiments. Autographic measurements with a hot wire at different small distances from an aluminum plate by G. V. SCHUBAUER showed among other things wedges of turbulence behind small obstacles or electric sparks. Other papers dealt with viscosity effects on swept wings, boundary layer control, supersonic wind drag, shock waves and other aerodynamic problems. *Subject Headings: 1. Boundary layer 2. Skin friction 3. Turbulence research 4. Symposia. I. Schubauer, G. B.—C.E.P.B.*

7.2-176

551.551

Hama, Francis R. (*Iowa Inst. of Hydraulic Res., State Univ. of Iowa*), **Spectrum equation of two-dimensional isotropic turbulence.** *Midwestern Conference on Fluid Mechanics*, 3rd,

*Univ. of Minnesota, March 1953.* p. 427-433. 8 refs., 21 eqs. DWB—"The inverse relation of OGURA's formula which connects the one and two-dimensional spectra in the two-dimensional isotropic turbulence field is derived. The exact similarity between the spectrum equations of three and two-dimensional isotropic turbulence is proved." This theory is useful in large scale oceanographic or atmospheric circulations where the vertical components are negligible compared with the horizontal. *Subject Headings:* 1. Turbulence spectrum 2. Isotropic turbulence 3. Statistical theory of turbulence.—M.R.

7.2-177

551.551:533.6

\*Klebanoff, P. S., **Characteristics of turbulence in a boundary layer with zero pressure gradient.** *U. S. National Advisory Committee for Aeronautics, Technical Note, No. 3178, July 1954.* 56 p. 26 figs., 20 refs., eqs. DWB—The results of an experimental investigation of a turbulent boundary layer with zero pressure gradient are presented. Measurements with the hot wire anemometer were made of turbulent energy and turbulent shear stress, probability density and flattening factor of u-fluctuations (fluctuation in x-direction), spectra of turbulent energy and shear stress, and turbulent dissipation. The importance of the region near the wall and the inadequacy of the concept of local isotropy are demonstrated. Attention is given to the energy balance and the intermittent character of the outer region of the boundary layer. Also several interesting features of the spectral distribution of the turbulent motions are discussed. *Subject Headings:* 1. Turbulent boundary layer 2. Pressure gradient.—*Author's abstract.*

7.2-178

551.551:551.558.21

Turner, H. S., **Clear air turbulence and topography.** *Weather, 10(9):294-297, Sept. 1955.* 4 figs., 6 refs. DWB—The neighborhood of clear air turbulence and standing waves over England is discussed. Turbulence occurs when the smooth wave motion is broken up by an unstable layer, a second ridge out of phase with the first, or a jet stream. *Subject Headings:* 1. Clear air turbulence 2. Lee waves.—C.E.P.B.

7.2-179

551.551:551.578.46:551.556

Woodruff, N. P. and Zingg, A. W., **A comparative analysis of wind tunnel and atmospheric air-flow patterns about single and successive barriers.** *American Geophysical Union, Transactions, 36(2):203-208, April 1955.* 6 figs., 4 refs. MH-BH—Atmospheric wind velocities were measured aft of a single and a series of three successive snow fences (on ungrazed Buffalo-grass pasture near Wakeeney, Kans.) and compared to velocities measured aft of models of the fences placed in a wind tunnel. Results indicate the wind tunnel approach gives a reasonable estimate of the effectiveness of full-scale surface barriers under atmospheric conditions. It is also shown that a series of three successive barriers is not enough to obtain a beneficial accumulative ground effect. A general lessening of velocity with distance traveled over the successive barriers indicates, however, that an accumulative effect might be obtained in a system containing a large number of successive barriers extending for a great length. The barriers are shown to increase the velocity fluctuations of the wind from two to nine times at different locations aft of a single barrier. Maximum fluctuations in a series of successive barriers were found to occur at the 0.5-ft elevations aft of the second barrier. *Subject Headings:* 1. Shelter belt effects 2. Snow fences 3. Turbulence 4. Wind tunnel experiments 5. Wind speed behind shelter belts.—*Authors' abstract.*

## WIND VARIATIONS AND VERTICAL DISTRIBUTION

*See also:* Storm damage (Kerr), 7.2-3; Wind field (Hollmann), 7.2-133; Cyclonic storms (Ramanathan), 7.2-135; Surface wind variations (Sakai), 7.2-197.

7.2-180

551.553.8(54)

\*Bhalotra, Y. P. R. (*Met. Off., New Delhi*), **Squalls at Delhi.** *Indian Journal of Meteorology and Geophysics, Delhi, 5(4):315-328, Oct. 1954.* 3 figs., 14 tables. DLC—Data for Safdarjung Aerodrome, New Delhi, for 10 years (1943-52) are used to study the statistical

distribution (annual, seasonal, diurnal, directional, speed and duration) of squalls and records are analyzed and presented (in graphs and tables) to show weather changes (temperature, humidity, dust, wind, pressure, thunder, etc.) during these storms. Finally, characteristics of 55 squalls, tabulated one by one, are presented. Squalls are defined as increase in wind speed by at least 3 stages of Beaufort force and reaching 25 mph or over, for at least 1 min. These are most frequent in May; between 1800 and 1900 IST, and from the SW to NW. 65% last 30 min or less. *Subject Headings:* 1. Squall frequencies 2. Squall characteristics 3. New Delhi Airport, India.—M.R.

7.2-181

551.553.8:525.6

G——, A——, *Ondes de tempête en Manche*. [Storm tides in the English Channel.] *France. Comité Central d'Océanographie et d'Étude des Côtes, Bulletin d'Information*, 7(4): 156-158, April 1955. 2 plates. DWB—Unusually severe storm conditions over the North Atlantic on Nov. 27 to Dec. 1, and Dec. 7 to 11, 1954, are discussed and analyzed on the basis of the records from Brest, Cherbourg, Le Havre and Dieppe. Curves for each station for the 2 periods show comparison between predicted and recorded levels at those places. Three barometric depressions passed during the two periods. These correspond roughly with the water level anomalies. Amplitudes are greater than in the open ocean. *Subject Headings:* 1. Storm tides 2. Wind effects on water level 3. French Channel Coast.—M.R.

7.2-182

551.554(282):551.553.12

Reiter, E. R., *Der mitführende Einfluss einer Flussoberfläche auf die darüberliegenden Luftschichten*. [The influence of a river surface in carrying along the overlying air layers.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):384-396, 1955. 8 figs., 4 tables, 13 refs., 7 eqs. German, English and French summaries p. 384. DWB—Profiles 0-4 m were made from a bridge 5 m above the upper Inn at Stams, with smoke bombs, a cinecamera and aspirated thermometers. With calms or very light winds at 4 m, the wind profiles followed a logarithmic law above a surface having a roughness parameter of 1.09 cm (ripples 1-2 cm high). The influence of the water flow (132-175 cm/s) could be traced to a height of 3 m. With up-valley winds above 2 m/s the wind profile changed abruptly to that appropriate to a very small roughness parameter ( $4.3 \times 10^{-6}$  cm). *Subject Headings:* 1. River breezes 2. Roughness parameters.—C.E.P.B.

## SPECIAL WINDS

7.2-183

551.555:551.584.3(435.15)

van Eimern, J., *Über eine Windbeeinflussung durch die Randhöhen des Elbetales bei Hamburg*. [On the influence of the bordering heights of the Elbe valley at Hamburg on the wind.] *Meteorologische Rundschau*, 8(5/6):97-99, May/June 1955. 2 figs., 5 refs. MH-BH—In 1953 the Agricultural Research Station at Hamburg measured moderate WSW winds at 25 m by captive balloon in open meadowland at different distances (up to 2 km) from the hills and by smoke plumes on the 50 m high Schornstein. Some results are shown graphically. Station 1, in lee of hills, showed a deflection to W compared with more open sites. Winds normal to high ground showed a reduction of 45% in speed. *Subject Headings:* 1. Local winds 2. Topographic effects 3. Elbe Valley, Germany.—C.E.P.B.

7.2-184

551.555.9(491)

§Mertins, O., *Schoners, ein Islandfangplatz mit besonders starken Nordostwinden*. [Schoners, an Iceland fishery with especially strong north-east winds.] *Wetterlotse*, No. 92:171-176, Sept. 1955. 3 figs. DLC—On April 20, 1955, with weak pressure gradients round Iceland, a ship at 63.2 N, 18.2 W reported an ENE wind, force 6-7; on April 28 at 63.5 N, 17.6 W reported ENE force 11 with seas up to 12 m high. With NE winds, jet winds (Düse) blow on the southeast coast of Iceland, down a glacial valley south of Vatnajökull and diverted by the eastern slope of Öröfajökull, separated by a belt of light winds. *Subject Headings:* 1. Local winds 2. Iceland.—C.E.P.B.

## WIND EFFECTS

See also: **Wind & windmills** (Karmishin), 7.2-13; **Storm waves in N. Atlantic** (Darbyshire), 7.2-48; **Wave height & period data** (Brown), 7.2-51; **Ocean wave measurem.** (Barber), 7.2-53; **Swell & wind pressure** (Walden), 7.2-54; **Cold waves** (Bochet, Frasse), 7.2-163; **Wind tunnel experiments** (Woodruff, Zingg), 7.2-179.

7.2-185

551.556:551.594:629.13

Chapman, Seville, **Effects of wind and space charge on corona point discharge, particularly from aircraft.** Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., Contract AF 19(122)-475, Report No. RA-766-P-11, Oct. 31, 1954. 30 p. 3 figs., refs., eqs. **DWB**—In a system for maintaining zero electrostatic charge on aircraft, where electric field meters on the surfaces of the wings control a high-voltage corona discharge point behind the tail of the aircraft, the primary factors influencing the magnitude of blow-away discharge current  $i$  are point potential  $V$ , aircraft speed  $v$ , point geometry, and space charge from the already discharged current.  $V$  must be large enough to create an electric field vector toward the rear to drive the discharge current into the space charge behind the point, but since this same  $V$  creates a field vector forward toward the aircraft skin, the point must be disposed so that the wind past the point prevents return current of the aircraft. The problem is approached mathematically from several points of view, to evaluate constants  $F$ ,  $G$ , and  $H$  in  $i = \epsilon_0 (FkV^2/l + GvV + Hlv^2/k)$ , where  $k$  is the mobility and  $l$  a length. The current should vary with the first powers of the speed and point potential, and be independent of mobility, and hence of polarity and altitude. For an aircraft speed of 100 m/sec and a point potential of 100 kv, the author considers that current should lie in the range 200–250  $\mu$ amp although calculations based on different approximations vary from 175–395  $\mu$ amp. Experiments in the laboratory with wind simulated by an electric field yield 225  $\mu$ amp. Meager and doubtful in-flight data imply current of about 200  $\mu$ amp. **Subject Headings:** 1. Corona discharges 2. Wind effects 3. Electrical charges on aircraft.—*Author's abstract.*

7.2-186

551.556:532.59

\*Hamada, Tokuchi; Mitsuyasu, Hisashi and Hose, Naoki, **An experimental study of wind effect upon water surface.** Tokyo. Transportation Technical Research Institute, Report, No. 8, June 1953. 22 p. 11 figs., table, 8 refs. **DWB**—A series of experiments was performed (i) to obtain wind wave characteristics in experimental wave tank, (ii) to determine both resistance and sheltering coefficients of wind drag upon water surface, and (iii) to measure the surface slope of mean water level due to wind drag. The method is described and results are compared with those of MUNK and others. Concluded that waves and drifts experimentally produced in a small scale wind tunnel agree fairly well with actually observed data in the field. **Subject Headings:** 1. Wind effects on water surfaces 2. Wind waves 3. Water surface slope.—*From authors' abstract.*

7.2-187

551.556:551.465

Munk, W. (Scripps Inst. of Oceanog., La Jolla, Calif.), **High frequency ocean waves.** I.U.G.G. Association of Physical Oceanography, Rome, Sept. 14-25, 1954, *Procès-Verbaux*. Bergen, 1954. p. 240. **DWB**—The high frequency tail of ocean wave spectrum has been studied by measurements of slope and curvature statistics. The high frequency components have a broad directional beam width, with considerable energy traveling  $60^\circ$  to either side of the wind. The slope statistics are in agreement with an elevation spectrum proposed by NEUMANN, but not with a spectrum proposed by DARBYSHIRE. **Subject Headings:** 1. Ocean wave spectra 2. Water surface slope.—*Author's abstract.*

7.2-188

551.556:551.465

Sarkisian, A. S., **Raschet statsionarnykh vetrovykh techenii v okeane.** [Calculation of steady wind currents in the ocean.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geofizicheskaiia*, No. 6:554-561, 1954. 4 figs., 8 refs., 14 eqs. **DLC**—The steady wind currents concentrated throughout the entire thickness of a baroclinic ocean layer are calculated for a basin with given shores with due consideration of the sphericity of the earth. The method is based

upon a more exact calculation of the eddies from wind stress. A comparison made between theoretical calculations and actual observations shows a close correspondence of the isoline in the center of the basin with actual surface flow. *Subject Headings: 1. Wind driven currents*  
**2. Ocean current measurement.—I.L.D.**

7.2-189

551.556:69

Schoemaker, R. L. A. and Wouters, I., **Wind loads on buildings.** *National Research Council of Canada, Technical Translation TT-488, 1954.* 27 p. 36 figs., 22 refs. **DWB—**Translation of their original article **Windbelasting op Bouwerken**, from *Het Bouwbedrijf*, 9(22):275-283, 1932. Theoretical and empirical studies on wind pressure on buildings, structures, billboards, etc. made in Holland are summarized. Structures of various sizes and shapes, interior pressures, effect of height above ground; pressure on overhanging eaves; hangars, sheds, roofs of various shapes, sheltering by other buildings, direction of exposure, region (3 different maximum wind-pressure regions are delineated for Holland, based on KNMI data for 50 m height), effect of gustiness, cyclones (tornadoes), snow loads, etc. are considered. *Subject Headings: 1. Wind loads on structures 2. Wind pressure on buildings*  
**3. Netherlands. I. Nathan, H. A. G. (trans.).—M.R.**

7.2-190

551.556:581.1

\*Soriano, Alberto, **Observaciones experimentales sobre el efecto del viento en las plantas.** [Experimental observations on the effect of wind on plants.] *Revista de Investigaciones Agrícolas, Buenos Aires*, 7(3):253-275, 1953. 14 figs., 8 tables, 6 refs. Abstracted from reprint. **DWB—**The effect of various wind velocities upon the transportation of *Larves tridentata*, *Bryophilum calycinum* and *Nicotiana glauca* was studied under controlled experimental conditions. The plants were subjected to wind velocities of 14 km/hr and 35.5 km/hr and to illumination intensities of 480 and 1000 candle power. The experimental results indicate that not all plants respond to wind action by a retardation in growth or by a diminution of amount of dry matter formed, and that wind action depends upon cultivation. *Subject Headings:*  
**1. Wind effects on plants 2. Plant ecology.—I.L.D.**

7.2-191

551.556.1:631.4

Tanaka, Sadao; Tanizawa, Tsuneo and Kodera, Shinji (*Kanto-Tosan Agric. Exper. Station*), **On the wind erosion of cultivated field, Pt. 1.** *Journal of Agricultural Meteorology, Tokyo*, 9(3/4):125-126, Aug. 1954. 3 figs., 3 tables, 2 refs. In Japanese; English summary p. 126. **MH-BH—1.** This study was made in order to find out the relation between wind erosion and the width of furrows. **2.** It was found that the wider the furrow became the higher the wave crest. But no definite ratio of the width of the furrow to the wave height was found. **3.** As to the relation between the width of the furrow divided by the wheat height and the wave crest height divided by the width of the furrow, the latter increases as the former increases. When the former becomes 12 to 15, however, the latter increases more. **4.** The inclination angle of the sand ripple in a wheat field is quite contrary to that on a sand dune; it is acute at the windward and obtuse at the leeward. As the sand ripple is formed in the furrow in the wheat field, most of the sand grains smaller than 0.1 mm in diameter blow away, while pebbles and coarse sand are left. *Subject Headings: 1. Wind erosion 2. Wind damage to cultivated soils.—From authors' abstract.*

7.2-192

551.556.2:551.578.46

\*Arai, Hideo, **Experimental studies on the snow protection forest with scale models under the simulated conditions of snow-storm.** *Seppyo (Snow and Ice)*, Tokyo, 16(1):1-12, Sept. 1954. 16 figs., 8 tables. In Japanese. **DWB—**Extensive quantitative measurements using a model of a forest (illustrated schematically) are analyzed and presented in graphs and tables. Experimental equipment is illustrated also. *Subject Headings: 1. Forest influences on snow storms 2. Shelter belts 3. Snow accumulation near forests.—M.R.*

7.2-193

551.556.2

†Gloyne, R. W., **Some effects of shelter-belts and wind-breaks.** *Metcorological Magazine*, London, 84(999):272-281, Sept. 1955. 2 tables, 47 refs. **DWB—**The reduction of mean

wind speed by open, medium and dense barriers is tabulated. Eddyding, shading and effect on soil and air temperature, heat balance, humidity, evaporation, snow cover, soil moisture and erosion or deposition are briefly discussed. Biological consequences are listed. Natural barriers and hilly regions are considered. A very full classified bibliography is given. *Subject Heading: 1. Shelter belt effects.*—C.E.P.B.

## UPPER AIR WINDS

See also: Jet streams (Grover), 7.2-134; Easterly jet stream (Ramanathan), 7.2-139; Report on high cloud observation (Saito, Narikawa), 7.2-218.

7.2-194

551.557:551.542.1

Radok, U. (*Univ. of Melbourne*), A comparison of geostrophic and observed upper winds. *Australian Meteorological Magazine*, Melbourne, No. 7:1-6, Nov. 1954. 4 figs., 9 refs. DWB—A comparison of geostrophic and observed upper winds was carried out in order to determine the extent to which a few widely scattered stations permit a detailed representation of especially the momentary (rather than the average) flow conditions in the upper troposphere and to show that the zonal scatter of the stations used in a meridional cross section can be taken often into account especially whenever the meridional height profiles of the isobaric surfaces tend to sway northwards or southwards with little change in shape. The analysis indicates that in the case of this cross-section for Southern Australia, important details in the high-level flow were not brought out by the available radiosonde observations, and that the accuracy of the derived errors has not suffered "through the use of stations differing by about 20 degrees in longitude." *Subject Headings: 1. Geostrophic winds 2. Upper air wind observations 3. Meridional cross sections 4. Australia.*—I.L.D.

7.2-195

551.557:551.542.1(943)

\*Treloar, H. M., Geostrophic wind approximation in low latitudes. *Australian Meteorological Magazine*, Melbourne, No. 7:7-12, Nov. 1954. 6 tables, ref. DWB—An examination of the geostrophic approximation based upon measurements of the W-E pressure gradient and wind components at various levels between Brisbane and Townsville obtained from radiosonde, rawin and pilot balloon wind observations. Mean cloud speeds and their relation to the geostrophic wind in these longitudes have been used and the theoretical position regarding geostrophic wind balance has been studied. Also the effect of radiosonde instrumental error on derived pressure gradient and the effect of variability of pressure gradient on derived high mean geostrophic winds has been considered. It was found that the geostrophic approximation for mean W-E motion seems close and that forecasts of W-E component winds for the Brisbane-Townsville stretch would probably on about 80% of occasions be within 10 kt for the range of winds below 10,000 ft, and within 15 kt for the range at 20,000 ft. *Subject Headings: 1. Geostrophic approximation 2. Zonal wind forecasts 3. Queensland, Australia.*—I.L.D.

7.2-196

551.557

Yamada, H. and Nakamura, S. (*Central Met. Obs., Japan*), Mean condition of wind aloft in winter over Japan. *Tateno, Japan. Aerological Observatory, Journal*, 5(4):323-335, March 1954. 10 figs., 7 refs. In Japanese; English summary p. 323. MH-BH—Using the data in the "Normal Mean Charts of Upper Air over Japan (Winter)" by the Aerological Section of the Central Meteorological Observatory, mean conditions of wind aloft over Japan in winter are studied. Vertical cross sections of monthly mean wind speeds along 140°E meridian from 30°N to 44°N are described, and the following results are obtained: (1) Wind speed over Japan reaches 80 m/sec at 200 mb level in winter which would be the strongest over the world. (2) In cross sections, usually two jet streams are found over Japan; one is located from 30°N to 36°N with 80 m/sec, the other northward from 40°N with 40-50 m/sec, both at 200 mb level. (3) Yearly variations of monthly mean wind speeds at 200 mb level are not small, particularly in Nov. and April, and the authors expect that the variations will

be connected to the problem of long range forecasting. *Subject Headings: 1. Winds aloft*  
**2. Upper air wind variations 3. Japan.—Authors' abstract.**

7.2-197

551.557.3:551.553.3:551.542.1

Sakai, Hajime, **On the relation between surface wind and gradient wind.** *Journal of Meteorological Research*, Tokyo, 6(10/11):575-576, Dec. 1954. 3 figs., 2 refs. In Japanese. DWB—Also in: Sendai, Japan. *Central Meteorological Observatory, Bulletin of the Meteorological Society for Research of Tohoku District*, 8(2):575-576, Jan. 1955. 3 figs. In Japanese.—The relationship between surface wind and gradient wind in the city of Shirakawa shows seasonal variation according to the isobaric curvature presented and according to the wind direction. *Subject Headings: 1. Surface wind variations 2. Gradient winds 3. Shirakawa, Japan.—H. Arakawa.*

## VERTICAL CURRENTS

*See also: Clear air turbulence (Turner), 7.2-178.*

7.2-198

551.558:797.55

Slater, A. E., **The "mystery" of soaring flight.** *Weather*, 10(9):298-303, Sept. 1955. DWB—The history of theory and practice of soaring by birds and gliders is summarized. Soaring in thermals, cumulus clouds (emphasizing their short life), lee waves and nonuniform winds is described. *Subject Headings: 1. Gliding 2. Soaring.—C.E.P.B.*

7.2-199

551.558.21:551.576.11

Rodwell, G., **Standing wave clouds observed from an aircraft.** *Weather*, 10(9):318, Sept. 1955. fig. DWB—Description of clouds seen from 7500 ft on Feb. 25, 1955, over and on lee of Skiddaw and St. Bee's Hd. *Subject Heading: 1. Lee wave clouds.—C.E.P.B.*

7.2-200

551.558.21:797.5

Wills, Philip, **Altitude in undress.** *Gliding*, 6(2):71-75, Summer 1955. 3 figs. DWB—Description of a glider flight over the Mackenzie country and Mt. Cook, in Southern Alps in New Zealand, in 6 lee waves to a height of 30,400 ft. *Subject Headings: 1. Gliding flights 2. Lee waves 3. New Zealand.—C.E.P.B.*

## AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

## HUMIDITY

*See also: Humidity measurem. techniques (Berger-Landefeldt), 7.2-71; special bibliography on Climate of Enclosed Spaces, p. 211.*

7.2-201

551.571:620.19

Cartwright, P. A. and Hudson, J. C., **Corrosion and meteorology.** *Nature*, London, 176(4485):748-749, Oct. 15, 1955. fig., table, 3 refs. DWB—CARTWRIGHT points out that in view of critical relative humidity for corrosion the hours per day of humidity in different ranges should be used instead of means. Figures are given for Singapore 1953. For deterioration of paint on metal, sun temperatures are important; at Singapore 130-150°F is normal. HUDSON gives annual variation of humidity ranges at Kew, Singapore and Pittsburgh but points out that SO<sub>2</sub>, salt spray or evaporation of dew are also necessary for corrosion. *Subject Headings: 1. Corrosion 2. Humidity effects.—C.F.P.B.*

7.2-202

551.571.4(26):532.517.4

†Brocks, K., **Wasserdampfschichtung über dem Meer und "Rauhigkeit" der Meeresoberfläche.** [Water vapor stratification over the sea and "roughness" of the sea surface.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, Vienna, 8(4):354-383, 1955. 3 figs., 6 tables, 30 refs., 17 eqs. German, English and French summaries p. 354-355. DWB

—Opens with a discussion of the height functions of atmospheric properties with adiabatic temperature gradient and PRANDTL's theory of the boundary layer. Difficulties arise in applying this to the ocean. The influence of temperature and wind stratification is considered on the basis of oceanic observations (Baltic, N. Atlantic, N. Pacific) up to 38 m. The effect of the temperature profile on the evaporation coefficient is calculated for different wind velocities and adiabatic values deduced. "These are shown to increase with the wind velocity from values corresponding to a hydrodynamically smooth boundary surface in case of small wind velocities to such occurring over a rough surface the roughness parameter of which grows with the wind velocity. No critical wind velocity can be observed; the transition to greater roughness seems to be steady." *Subject Headings:* 1. Humidity profiles over sea 2. Boundary layer theory.—C.E.P.B.

## EVAPORATION AND EVAPOTRANSPIRATION

See also: Water loss investigations (U. S. Geological Survey, U. S. W. B.), 7.2-11;  
Evaporimeters (Glazova, Laikhtman), 7.2-92.

7.2-203

551.573:01

†Budyko, M. I., Ob opredelenii ispareniiia s poverkhnosti sushi. [Determination of evaporation from land surface.] *Meteorologiya i Gidrologiya*, Leningrad, No. 1:52-58, Jan. Feb. 1955. 32 refs., 8 eqs. DWB—The author reviews briefly the principal methods of determining evaporation from land. These include the water balance method; the relationships between evaporation, precipitation and potential evaporation; the method of POLIAKOV involving the dynamics of moisture in the upper soil layers; the climatic method of calculating annual variation of evaporation developed by ALBRECHT and the author's own method of calculating annual evaporation by solving the equations of water and heat balance. An extensive bibliography on the problem of measuring evaporation from land is given. *Subject Headings:* 1. Evaporation calculations 2. Evaporation from soil 3. Evaporation bibliographies.—I.L.D.

7.2-204

551.573:492

\*Dey, L. J. L. (Royal Dutch Met. Inst., Dir. of Climatological Sec.), The lysimeter station at Castricum, Holland. *International Union of Geodesy and Geophysics. Association of Scientific Hydrology, Oslo, 1948, [Transactions]*, 3:11-15, [1950?] table. DWB—Present precipitation, percolation and evaporation data for each year for the period 1942-47. One lysimeter was in bare soil, the others were covered by natural dune vegetation, deciduous and coniferous woods. Evapotranspiration was 40-80% higher than evaporation from soil. *Subject Headings:* 1. Lysimeter observations 2. Evapotranspiration 3. Castricum, Netherlands.—A.A.

7.2-205

551.573:551.55

Grigor'eva, A. S., Raschet ispareniiia v estestvennykh usloviakh s pomoshch'iu diffuzionnogo metoda. [Evaporation calculation under natural conditions with aid of diffusional method.] *Leningrad. Glavnaia Geofizicheskaiia Observatoriia, Trudy*, 16(78):113-120, 1948. 6 figs., 2 tables, 6 refs. DLC—Evaporation was computed by means of ROSSBY's turbulence equation for adiabatic and VUDYKO's equation for convective conditions. The diurnal variation for selected days is compared with temperature, wind speed, saturation deficit and coefficient of exchange. The limiting factor is the moisture content of the soil, causing the greatest differences in evaporation. *Subject Headings:* 1. Evaporation 2. Turbulent transfer of moisture 3. Turbulent diffusion.—A.A.

7.2-206

551.573:551.575

Ogiwara, S., Relations between the temperature and the rate of evaporation of fog cloud and rain drops: fogs caused by the evaporation of rain drops. (Studies on evaporation Pt. 5.) *Meteorological Society of Japan, Journal, Ser. 2*, 25(4/6):60-67, April/June 1948. figs., refs. In Japanese; English summary, Abstract section, p. 12. DLC—The author mea-

numerical computations to show the possibility that frontal fog, or nonsaturated air, may become saturated by evaporation of water drops falling through the air. Examples are given. *Subject Headings:* 1. Evaporation of raindrops 2. Fog formation 3. Saturation over drops. —H. Arakawa.

## CONDENSATION

7.2-207

551.574.41

Arai, Tetsuo (*Training Inst. Meteor. Observ., Japan*), **Temperature of the condensation surface and amount of dew.** (Studies on dew, Pt. 3.) *Journal of Agricultural Meteorology*, 9(3/4):127-130, Aug. 1954. 3 figs., table, 9 refs., 12 eqs. In Japanese; English summary p. 130. **MH-BH**—This paper deals with the heat balance of the surface of a body on which dew condenses. Let  $Q_r$  (cal/cm<sup>2</sup>sec) be the heat loss of the body by radiation,  $Q_c$  by conduction,  $w$  (g/cm<sup>2</sup>sec) the rate of condensation of dew, and  $L$  the latent heat of vaporization. Then equation (2) holds true, in which  $Q_r$  was determined by BRUNT's formula as shown by equation (3) and (4).  $Q_c$  and  $w$  were determined by the formula of M. TEN BOSCH in the case of natural convection, and that of BRASIUS in the case of laminar flow of air, applying the law of similarity. So we obtain formulas (7), (8), (9) and (10). The equation obtained by substituting these into (2) above was solved graphically with the help of Figs. 1 and 2 and the temperature difference of air from the plane surface was obtained. We can get the surface temperature and the amount of dew on a body, using the observed values of air temperature, vapor pressure and wind force. The calculated values agree well with the observed ones. (For Pts. 1 and 2, see 3D-200, April 1952, *MAB*.) *Subject Headings:* 1. Condensation processes 2. Dew formation.—*Author's abstract.*

7.2-208

551.574.1 536.421:546.212

Imai, Ichiro, **On the freezing of water.** *Seppyo (Snow and Ice)*, Tokyo, 11(3):100-103, 1949. figs., foot-refs. In Japanese; English summary p. 10. **DWB**—The freezing process of water in a glass dish was studied in a low temperature room. (1) The crystallization velocity of ice perpendicular to the c-axis is much greater than that parallel to it. (2) The surface ice originates from small discoidal germs, each of which rises up to the water surface immediately after formation, turning its plane horizontal. Consequently, the surface ice usually has its c-axis nearly vertical. (3) The needle-like parts in the surface ice are grown from inclined germs. (4) In the case of icicles and ice columns also, the c-axes are nearly perpendicular to the direction of growth. This is the result of a kind of selection effect, in that only a few favorable crystals can grow sufficiently among those from randomly oriented nuclei. (5) When the degree of supercooling is high, it is supposed that new nuclei are continually generating during crystal growth. *Subject Headings:* 1. Freezing of water 2. Ice crystal formation.—*Author's abstract.*

7.2-209

551.574.1:551.578.41

Kobayashi, Teisaku, **Ice crystals of rectangular plane form.** (Studies on small ice crystals, Pt. 1.) *Sapporo, Japan. Hokkaido Univ. Institute of Low Temperature Science, Contributions*, No. 5:1-5, 1954. 18 figs., 16 refs. **DWB**—The author observed some ice crystals of rectangular plane form apparently belonging to the cubic system during the experiments of artificial precipitation of snow carried out at Asahigawa last winter. We were also able to verify the existence of this crystal form in our low temperature laboratory. The conditions under which they were formed will be described with some photomicrographic illustrations. (For Pt. 2, see 6.8-280, Aug. 1955, *MAB*.) *Subject Headings:* 1. Ice crystal forms 2. Artificial precipitation 3. Asahigawa, Japan.—*Author's abstract.*

7.2-210

551.574.1

Schaefer, Vincent J. (*Dir. of Res., Munitalp Foundation*), **Nuclei, water drops and ice crystals.** (Simple experiments in atmospheric physics, Pt. 2.) *Weatherwise*, Boston, 8(3): 68-71, June 1955. 3 photos. **DWB**—Aerosols, condensation nuclei, ice nuclei, cloud formation, dew point, warm, cool and cold clouds are discussed and illustrated from the point of

view of the amateur wishing to perform simple experiments to gain understanding of the processes of cloud physics. *Subject Headings:* 1. Condensation nuclei 2. Ice nuclei 3. Cloud physics.—*M.R.*

7.2-211

551.574.1:551.578.41

Soulage, Guy, *Sur les cristaux de glace obtenus par l'action de l'iodure d'argent sur les stratus surfondus*. [Ice crystals obtained by action of silver iodide on supercooled stratus.] *Puy-de-Dôme, Observatoire, Bulletin*, Ser. 2, No. 2:41-50, April 1953. 20 photos, 2 tables, 5 refs. *DWB*—The various types of crystals obtained are as follows: hexagonal columns, hexagonal plates with internal structure, and hexagonal plates without internal structure. The structures of these crystals, and their frequencies and the temperatures under which they occur are described. Photographs of the crystals are presented. *Subject Headings:* 1. Ice crystal formation 2. Ice crystal forms.—*I.L.D.*

7.2-212

551.574.42:621.311

Kito, Shijyo, *Studies on sleet jump*. *Researches on Snow and Ice*, Tokyo, No. 1:93-99, Nov. 1953. 6 figs., table, 5 refs., 15 eqs. In Japanese. *DWB*—The author develops a theory of the sleet jump, where this terminology is applied doubly; i.e., the swinging of a transmission wire due to snow accretion and the resultant spark. He treats the mechanical swinging of power cables also. *Subject Headings:* 1. Glaze 2. Electric power systems.—*H. Arakawa*.

7.2-213

551.574.7:629.13.014.1

Messinger, Bernard L. (*Lockheed Aircraft Corp.*), *Equilibrium temperature of an unheated icing surface as a function of air speed*. *Journal of the Aeronautical Sciences*, 20(1):29-42, Jan. 1953. 15 figs., table, 9 refs. *DLC*—The thermal analysis of heated surface icing conditions has been extensively treated in the literature. Except for the work of TRIBUS, however, little has been done on the analysis of an unheated icing surface. This latter analysis is significant in the design of cyclic thermal de-icing systems that are attractive for small high-speed aircraft for which thermal anti-icing requirements have become severe. In this paper, a complete analysis of the temperature of an unheated surface in icing conditions is presented for the several significant régimes (i.e., less than 32°F, at 32°F, and above 32°F) as a function of air speed, altitude, ambient temperature, and liquid water content. The results are presented in graphical form and permit the rapid determination of surface temperature for a wide range of variables. Curves are presented to determine the speeds beyond which no ice accretion will occur. Curves are also presented to indicate the surface temperature and the rate of ice sublimation which takes place when an ice covered surface emerges into clear air. One significant result of this study is the introduction of a new basic variable referred to as the "freezing fraction," which denotes the proportion of the impinging liquid which freezes in the impingement region. The fact that some of the liquid does not freeze in the impingement region tends to explain the observed variation in ice formation shape with temperature, speed and water catch. New test data obtained at Mt. Washington, N. H., for stagnation-point surface temperatures of an unheated plastic cylinder in natural and artificial icing conditions are included in the Appendix. These data substantiate the validity of the assumptions made in the theoretical analysis. *Subject Headings:* 1. De-icing of aircraft 2. Unheated icing surface.—*Author's abstract*.

## FOG

*See also: Fog formation* (Ogiwara), 7.2-206.

7.2-214

551.575.1(54)

\*Basu, Amal (*Reg. Met. Center, Calcutta*), *Frequency of fog at Alipore, Dum Dum and Barrackpore*. *Indian Journal of Meteorology and Geophysics*, Delhi, 5(4):349-355, Oct. 1954. 5 figs., 5 tables, 3 refs. *DLC*—Extensive tables of fog frequency for each month (1948-52), of wind from 16 directions, of time of fog commencement and dispersal, duration and temperature are presented and discussed, and graphs showing frequencies, etc. for 3 places included.

for comparative purposes. The stations of Alipore, Dum Dum and Barrackpore are 50-75 mi from the Bay of Bengal along the Hooghly River. Dum Dum has the most fog but in the coldest months (Dec. and Jan.) Alipore has the most cases. At Dum Dum Feb. is the peak month—due to marshy land. At Alipore the smoke from the city contributes to the cold weather maximum. Between 0500 and 0600 all stations have the maximum frequency and dissipation occurs between 0800 and 0900 I.S.T. *Subject Headings: 1. Fog frequencies 2. Fog duration 3. Hooghly River, India 4. Alipore, India 5. Dum Dum, India 6. Barrackpore, India.—M.R.*

7.2-215

551.575.36:551.509.59 551.576.36

\*Schneider, R. (*Swiss Met. Serv., Zurich Airport*), *Brouillards et stratus bas (brouillards élevés) à l'Aéroport de Zurich-Kloten, période 1948-1953*. [Fog and low stratus (high fog) at Zurich-Kloten Airport during 1948-1953.] *Switzerland. Meteorologische Zentralanstalt, Annalen*, V. 90, 1953, pub. 1954. (9 p. following Anhang No. 7.) 12 figs., 8 tables, 7 refs. DWB—Detailed statistical analyses of frequency of fog and stratus at Zurich Airport with elaborate tables and graphs show the seasonal and diurnal variations in 1) moderate fog, 2) dense fog, 3) stratus below 1000 m and 4) below 150 m above the ground. Comparison is made between frequency at Dubendorf Airport (1938-48) and Kloten Airport (1948-53), showing greater frequency at Kloten in almost every month. Curves of probability of 4 situations listed above as a function of month and time of day of fog, as a function of temperature and fog free days (1936-53) with accompanying tables and discussion, are presented for the purpose of aiding the forecaster. *Subject Headings: 1. Fog frequencies 2. Stratus frequencies 3. Local forecast studies 4. Zurich-Kloten Airport, Switzerland.—M.R.*

## CLOUDS

See also: *Funnel clouds* (Pestell, Smith), 7.2-144; *Standing wave clouds* (Rodwell), 7.2-199; *Fog & low stratus* (Schneider), 7.2-215.

7.2-216

551.576.1:629.135.2

Howland, B. G., *Peculiar contrails*. *Weather*, 10(9):316-317, Sept. 1955. fig. Also: Henley, E., *Another peculiar contrail*. *Ibid.*, p. 318. fig. DWB—HOWLAND describes and illustrates 5 stages of breaking up of nonpersistent double contrails from a Boeing V 47. Sometimes the contrails form beads. HENLEY describes a contrail on April 24, 1955, near Forest Gate, apparently at junction of two air masses. *Subject Heading: 1. Condensation trails.—C.E.P.B.*

7.2-217

551.576.1:629.135.2

Scorer, R. S., *Condensation trails*. *Weather*, 10(9):281-287, Sept. 1955. 4 figs., 3 photos, table. DWB—The physics of formation and evaporation of contrails is explained simply. Persistent trails lie below condensation level and above "ice-evaporation" level, nonpersistent trails below the latter. The form of a trail is determined by mixing with surrounding air, downward motion due to the aircraft (which also causes distails, not to be confused with contrail shadows), wing tip vortices, shear in the air and falling of large ice crystals. *Subject Heading: 1. Condensation trails.—C.E.P.B.*

7.2-218

551.576.5:551.515.227:551.557.3

Saito, Shoichi and Narikawa, Jiro, *Report on cooperative observations of high clouds in West Japan*. *Journal of Meteorological Research*, Tokyo, 6(8):299-314, Nov. 1954. 23 figs., 3 tables, 14 refs. In Japanese; English summary p. 299. DWB—During the two years 1951 to 1952 cooperative observations of high clouds were carried out at all weather stations in West Japan. The principal conclusions may be summarized as follows: (1) Direction and velocity of high cloud at 10 km level are almost the same with those of actual wind, respectively. (2) Stripes of cirrus cloud are in the same direction of wind only when the wind speed is rather high. (3) High cloud direction is useful for weather forecasting, especially for forecast of track of typhoon. (4) Cirrus stripes generally appear in the northeast quadrant of a typhoon. (5) Cirrus clouds usually occur in the transitional layer of temperature discontinuity at eleva-

tions of 9 to 10 km; cirrus stripes in a typhoon area generally occur in the layer of large vertical wind shear. *Subject Headings:* 1. Cloud movement 2. Cirrus clouds 3. Upper air winds 4. Typhoon tracking 5. Cirrus clouds—typhoon relationships 6. Japan.—*Authors' abstract.*

## PRECIPITATION

*See also:* Rainfall observations (Schneider-Carius), 7.2-73; Weather forecasts (Abbot), 7.2-105; Long range precip. forecasting (Abbot), 7.2-106.

7.2-219

551.577:628.1(410)

Glasspoole, J., Rainfall and water supplies. *British Waterworks Association, London Journal*, 37(286):437-441, July 1955. fig., 4 refs. GB-MO—Describes the arrangements for observations of rainfall, instruments and exposure. Average varies from 20" in Thames Estuary to 200" on Snowdon. Monthly distribution, general trends, fluctuations from year to year and in short periods are briefly discussed. *Subject Headings:* 1. Rainfall 2. Water supply 3. Great Britain.—*C.E.P.B.*

7.2-220

551.577:577.4:636.3(429)

Hughes, R. Elfyn, Ecology of livestock productivity. *Nature*, London, 176(4482):595-596, Sept. 24, 1955. 9 refs. Also: Bradshaw, A. D. and Pritchard, Tom, Wild white clover in natural mountain grassland. *Ibid.*, p. 596. 2 refs. DWB—HUGHES discusses the summer grazing intensity (sheep) over Snowdonia in relation to rainfall, soil and drainage. In the wetter regions rainfall is the dominant factor; with a rainfall below 80" the parent rock is also important. The second note describes the value of wild white clover in rainy elevated parts of Snowdonia. *Subject Headings:* 1. Animal ecology 2. Sheep breeding 3. Snowdon, Wales.—*C.E.P.B.*

7.2-221

551.577:621.396.9

Hunter, I. M., The application of a two channel circularly polarised radar to the suppression of rain echoes. *Malvern, England. Radar Research Establishment, R.R.E. Journal*, No. 36:1-37, April 1955. 23 figs., 5 refs., 14 eqs. Mimeo. GB-MO—A circularly polarized wave can be resolved into 2 orthogonal plane polarized waves with a phase separation, one of which rain gives no signal. Apparatus ("echo polarization analysis radar") is described and its working discussed in detail. Practical results were only partially successful in the bright band and heavy thunderstorm rain owing to the nonspherical shape of the raindrops, but normal rain completely disappeared into receiver noise. *Subject Heading:* 1. Radar precipitation echoes.—*C.E.P.B.*

7.2-222

551.577(914):621.311.21

McIntyre, Wallace E. (*Ill. St. Normal Univ., Normal*), Philippine hydroelectric development. *Scientific Monthly*, 80(2):117-123, Feb. 1955. 9 figs., 4 refs. DLC—In an article discussing and illustrating hydroelectric projects and the areas of north Central Luzon which are the sites of long-range power development projects, the author presents monthly histogram charts showing the rainfall distribution in the Agno River-Baguio area, and in the Lake Lanao area, respectively. In the former area the annual range is extreme: <1" in March and April, and 24" in Aug. The world's record 24 hr rainfall (48") and a total of 105" in <1 week occurred here. In the Lake Lanao area the range is from an average of 4" in April to 18" in Nov. *Subject Headings:* 1. Rainfall extremes 2. Hydroelectric projects 3. Luzon, Philippine Islands.—*M.R.*

7.2-223

551.577.2/3(81)

†Schröder, Rudolf, Verteilung und jährlicher Gang der Niederschläge im Staat São Paulo. [Distribution and annual variation of rainfall in the State of São Paulo.] *Petermanns Geographische Mitteilungen*, 99(3):193-209, 1955. 35 figs., 5 tables, 31 refs. DLC—The climatic factors (position, topography, air masses) are set out and the main features of rainfall distribution described. A large colored chart, based on 249 stations, shows the mean annual rainfall 1941-1951. Diagrams compare 1941-51 with long period monthly and annual averages.

for selected stations, and give actual amounts in different months and percentage of annual total, winter and summer rainfalls and frequency distribution of annual amounts. All these diagrams are discussed in detail. Tables show days with rain, mean amount in a rain day, rainfall probability and variability. *Subject Headings:* 1. Rainfall distribution 2. Rainfall variations 3. São Paulo, Brazil.—*C.E.P.B.*

7.2-224

551.577.2(44)

†Balseinte, Raymond, *La pluviosité en Savoie*. [Rainfall in Savoy.] *Revue de Géographie Alpine*, Grenoble, 43(2):299-355, 1955. 10 figs., tables, 54 refs. **DWB**—Thorough study of the rainfall and snow in Savoy—an essentially Alpine region. Chart shows several dozen stations in relation to ranges or basins. Difference between means for 1880-1910 and 1934-50, shown in table, indicates that the number of stations with increased precipitation in the latter period far exceeds the number with decrease in precipitation. Includes annual, seasonal and monthly variability, probability of precipitation, seasonal regimes, fog and intensity of precipitation, major droughts and prolonged wet spells and frequency thereof, thunderstorms and storm rainfall, seasonal wind roses for rainy and for all days, snow days compared with precipitation days, high altitude snowfall, increase of precipitation with altitude in various basins. *Subject Headings:* 1. Precipitation data 2. Snowfall data 3. Alpine climates 4. Savoy, France.—*M.R.*

7.2-225

551.577.2(521.2):551.515.8

§Kamiko, Toshiro, *Precipitation association with the Bōsō front*. *Journal of Meteorological Research*, Tokyo, 6(12):609-614, Jan. 1955. 6 figs. In Japanese; English summary p. 609. **DWB**—A synoptic study of precipitation associated with the Bōsō front is made and the results are as follows: (1) The precipitation is accompanied by the advection of upper cold air and upper trough. (2) The horizontal distribution of precipitation over Kantō District is classified in two different types and the characteristic features are shown in Fig. 5. (3) The bad weather persists during the period of developing anticyclone in the vicinity of Lake Baikal. *Subject Headings:* 1. Frontal type precipitation 2. Bōsō front 3. Japan.—*Author's abstract.*

7.2-226

551.577.3(861)

\*Herrera A., Edgard, *La precipitación pluvial en Chinchina en 12 años, 1942-1953*. [Rainfall in Chinchina in 12 years, 1942-1953.] *Centro Nacional de Investigaciones de Café, Chinchina, Colombia. Biblioteca, Boletín Informativo*, 6(64):118, April 1955. figs., tables, 11 refs. **DWB**—Average precipitation for 12 years of record was 2571 mm (>100"), but extreme variability from month to month and year to year is seen in the excellent graphical analysis presented and discussed. Two rainy seasons (April-May and Oct.-Nov.) and two dry (Jan.-Feb. and July-Sept.) are plainly indicated. *Subject Headings:* 1. Rainfall variations 2. Rainfall data 3. Chinchina, Colombia.—*M.R.*

7.2-227

551.577.3:663.85(689)

Laycock, D. H. and Foster, L. J., *Rainfall and biennial bearing in tung* (*Aleurites montana*). *Nature*, London, 176(4483):654, Oct. 1, 1955. 2 figs. **DWB**—Yield of the tung tree in Nyasaland 1947-1954 showed a marked biennial variation. Correlation of +.84 was found between rainfall June-Aug. and crop harvested in following May. *Subject Headings:* 1. Rainfall variations 2. Tung trees 3. Nyasaland.—*C.E.P.B.*

## SNOW

*See also:* Snow conservation (Fekete), 7.2-66; Winter weather (Bergeron), 7.2-78; Snow albedo (Hubley), 7.2-156; Snow fences (Woodruff, Zingg), 7.2-179; Snow accumulation near forests (Arai), 7.2-192; Ice crystal form (Kobayashi), 7.2-209; Ice crystal formation (Soulage), 7.2-211.

7.2-228

551.578.4(234.3)

\*Boisvert, Jean Jacques, *La neige dans les Alpes Françaises*. [Snow in the French Alps.] *Revue de Géographie Alpine*, Grenoble, 43(2):357-434, 1955. 10 figs., 9 tables, 38 refs. **DWB**

—A most elaborate study of snowfall and snow cover in the French Alps, based on data from scores of stations, all of which is analyzed and presented in regional tables and charts. Snow bearing winds are first investigated—westerly on west slopes and southerly on south slopes giving greatest snowfall. Intensity, duration, proportion of all precipitation (coefficient of nivosity) which falls as snow, regional differences in snow and days with snow and, finally, avalanches are discussed. Representative data tables for avalanches—some exhaustive—are included. *Subject Headings:* 1. Snow data 2. Snowfall 3. Alpine climatology 4. French Alps.—*M.R.*

7.2-229

551.578.4

Magono, Choji, **Falling velocity of snow flakes.** *Researches on Snow and Ice*, Tokyo No. 1:19-28, Nov. 1953. 10 figs., 9 plates, table, 7 refs. In Japanese. DWB—The velocity of the falling snowflakes is observed by means of optical methods. A semitheoretical formula for the falling velocity  $u = [\{8(\rho - \sigma)g r / 3\sigma\} 0.35 - 3\rho + (1.00 - 20\rho)r]$  is derived, where  $\rho$  is the density of snow flakes,  $\sigma$  the density of air,  $g$  the acceleration of gravity, and  $r$  the radius of snowflake (assuming it is a sphere), in cgs. unit. *Subject Heading:* 1. Terminal velocity of snowflakes.—*H. Arakawa.*

7.2-230

551.578.4

Inaho, Yoshinobu, **Angle of kinetic friction of snow.** *U. S. Snow, Ice and Permafrost Research Establishment, Translation*, No. 42, Jan. 1955. 5 p. 5 figs., table. NOTE: Translation by Charles A. Meyer & Co., Inc., from original Japanese work, *Sekisetsu no do-masatsukaku ni tsuite*, in *Seppyo* (*Snow and Ice*), Tokyo, 3:303-307, 1941. DWB—Adhesive forces and kinetic friction constants were determined for snow blocks sliding on an inclined plane. Procedure is outlined. The friction angle varies between 23° and 29°. Adhesive forces were 0.1 to 0.9 gcm<sup>-2</sup> and can be practically disregarded. *Subject Headings:* 1. Snow mechanics 2. Snow friction.—*A.A.*

7.2-231

551.578.89:59

Lawrence, E. N., **Raining fish.** *Weather*, 10(10):345-346, Oct. 1955. DWB—Reference to a number of occurrences. The decline in frequency during the 20th Century may be due to climatic change. *Subject Heading:* 1. Showers of fish.—*C.E.P.B.*

## HYDROMETEOROLOGY

See also: **Hydrological yearbooks** (Italy. Ist. Idrografico), 7.2-12; **Runoff forecasting** (Sapozhnikov), 7.2-110.

7.2-232

551.579.1

Odell, N. E., **Mount Ruapehu, New Zealand: observations on its crater lake and glaciers.** *Journal of Glaciology*, 2(18):601-605, Oct. 1955. 7 figs., 9 refs. English and German summaries p. 601. DWB—On Dec. 25, 1953, a train broke through the bridge over the Whangaehu River with 151 casualties, owing to a flood of water and mud. The flood was caused by the rising waters of the lake bursting through a barrier of ash and ice. *Subject Headings:* 1. Glacial floods 2. New Zealand.—*C.E.P.B.*

7.2-233

551.579.4:627.5

Reddoch, A. F. and Milston, A. K., **Flood mitigation in New South Wales.** *Institution of Water Engineers, London, Journal*, 9(3):271-285, May 1955. 4 figs., 6 tables, 13 refs. DWB—Methods discussed are catchment protection by reafforestation (which also reduces erosion); provision of storage sites by dams, which may also serve other purposes; and increasing flood-carrying capacity of rivers. The maximum recorded discharge of New South Wales rivers, and isohyets of June 1949 (one of the flood months) are set out. The chief contributor to floods is the small Wollombi Brook because of its heavy rainfall. Methods of increasing flood capacity discussed (including economics) are improvement of river channel construction of levees, increasing stream gradient by cutoffs, and enlargement of channels.

Flood warnings by radio are being introduced. *Subject Headings:* 1. Flood control 2. New South Wales, Australia.—C.E.P.B.

7.2-234

551.579.5:551.584.31

van't Woudt, Bessel D. (*New Zealand, Dept. of Agric.*), **On a hillside moisture gradient in volcanic ash soil, New Zealand.** *American Geophysical Union, Transactions*, 36(3):419-424, June 1955. 3 figs., 5 tables, 4 refs. **DWB**—Data on a moisture gradient in the surface soil on a slope of about 30° and about 50 ft long in a small valley are presented. Moisture increases more or less gradually from the top to the foot of the slope. Three factors seemed to contribute toward the establishment of this gradient: (1) an increase from the top to the bottom of the slope in the depth of soil wetted during a rain storm as a result of (a) surface- and sub-surface storm flow, and (b) incomplete wetting by rain of the surface soil on the upper half of the slope because of a resistance to wetting generally exhibited by the soil in this position; (2) an increase in moisture retention capacity of the soil with descent on the slope; and (3) decreasing evaporation from the soil surface with descent on the slope apparently because of decreased exposure to air currents. *Subject Headings:* 1. Soil moisture gradient 2. Slope microclimatology 3. New Zealand.—*Author's abstract.*

7.2-235

551.579.5

Veihmeyer, F. J. and Hendrickson, A. H., **Does transpiration decrease as the soil moisture decreases?** *American Geophysical Union, Transactions*, 36(3):425-428, June 1955. 5 figs. E. A. Colman et al., **Discussion.** *Ibid.*, p. 429-448. 11 figs., 7 tables, refs. p. 447-448. **DWB**—This paper gives results obtained from a prune tree and from a pine tree grown in a suspended tank that permitted the obtaining of a continuous record of moisture loss from the soil. Additional results from field trials with pine, oak, and manzanita on a watershed area and from apricot and prune trees under cultivation show that the rate of moisture extraction from the soil is not influenced by the water in the soil so long as the latter is above the permanent wilting percentage. *Subject Headings:* 1. Transpiration-soil moisture relationships 2. Transpiration of trees 3. Soil moisture. I. Colman, E. A. et al.—*Authors' abstract.*

## CLIMATOLOGY AND BIOCLIMATOLOGY

### CLIMATOLOGY

7.2-236

551.58 91(02)

†Heintzelman, Oliver Harry and Highsmith, Richard M., Jr., **World regional geography.** N. Y., Prentice-Hall, 1955. 357 p. numerous figs. (incl. photos), bibliog. at end of each ch. **DWB**—In Ch. I there is a brief treatment of the physical elements important in geography: weather and climate, hydrology, soil, vegetation, etc. Separate chapters discuss and illustrate geography, including climate of the rainy tropics, wet-dry tropics, monsoon tropics, tropical deserts, tropical highlands, dry summer subtropics, humid subtropics, long summer and short summer humid continental regions, dry continental, marine west coast mid-latitude highlands, subarctic and polar regions. For each region several (3) standard monthly climatic graphs (temperature and precipitation regime) and a discussion of atmospheric circulation, temperature and precipitation and other significant features of climate are included. *Subject Headings:* 1. Regional climates 2. Geography textbooks.—M.R.

7.2-237

551.58:523.4:58

Tikhov, G. A., **Is life possible on other planets?** *British Astronomical Association, Journal*, 65(5):193-204, April 1955. **DLC**—Argues for the existence of plant life on Mars, adapted to a severe climate in the same way as plants of high altitudes on Pamirs. It absorbs all the long-wave part of the solar spectrum and hence appears blue. On Venus plants would be yellow-brown. On Saturn, Uranus and Neptune bacteria can live in the lower atmosphere and cause the presence of methane and ammonia. The spectrum of methane on these planets shows that it is of organic origin. *Subject Headings:* 1. Planetary climates 2. Planetary vegetation.—C.E.P.B.

## CLIMATE OF PARTICULAR PLACES

See also: *Climate of India & Pakistan* (Spate), 7.2-4; *Annual met. reports* (Italy. Ist. Idrografico), 7.2-12; *Annual climatic reports* (Spain. Servicio Met. Nacional), 7.2-83.

7.2-238

551.582(711)

\*British Columbia. Dept. of Agriculture, *Climate of British Columbia: tables of temperature, precipitation and sunshine. Report for 1954. Data compiled at Gonzales Observatory, Victoria. Victoria, B. C., 1955. 37 p. entirely tables. DWB*—Monthly and annual means and extremes for 1954, and for entire period of record are given for 180 temperature, 250 precipitation, 20 sunshine and 61 inactive temperature and 125 inactive precipitation stations in British Columbia. Temperature and precipitation stations are arranged alphabetically within each of 22 natural regions. Records range from 1 to 64 yrs in length, elevations from 4 to 7700 ft above sea level. *Subject Headings: 1. Climate of British Columbia 2. Annual meteorological data 3. British Columbia. I. Victoria, B. C. Gonzales Observatory II. Mackie, William H.—M.R.*

7.2-239

551.582:581.5:551.45(764)

†Lunchbaugh, John L. (*Sch. of Forestry, Univ. of Calif., Berkeley*), *Vegetational changes in the San Antonio Prairie associated with grazing, retirement from grazing and abandonment from cultivation. Ecological Monographs, Durham, N. C., 25(1):39-57, Jan. 1955. 15 figs., 4 tables, bibliog. p. 57. DLC*—Brief note on climate of San Antonio Prairie on p. 42. *Subject Headings: 1. Ecological climatology 2. San Antonio Prairie, Texas.—M.R.*

7.2-240

551.582.1(752)

\*Ashbaugh, Byron L. and Brancato, G. N., *Maryland's weather. Maryland. Board of Natural Resources, Educational Series, No. 38, June 1954. 40 p. 24 figs. (incl. photos), 7 tables. DWB*—A well illustrated, imaginative popular pamphlet giving details about the Weather Bureau Service in Maryland, climatic variations, history of weather records, general meteorology and forecasting, including monthly data and annual charts on snow, precipitation, temperature and frost for about 50 stations in Maryland and 7 in Delaware. Names of observers and periods of record at 116 Maryland, 12 Delaware and 5 D. C. stations are listed. *Subject Headings: 1. Climate of Maryland 2. Maryland Weather Service 3. Popular meteorology 4. Maryland 5. Delaware.—M.R.*

7.2-241

551.582.1(82)

†Paryski, Witold H., *Klimat południowej Puna de Atacama. [The climate of the southern Puna de Atacama.] Przegląd Meteorologiczny i Hydrologiczny, Warsaw, 6(1/2):89-109, 1953. table, 92 refs. English summary p. 105-7. DWB*—A description of the climate of southern Puna de Atacama, based on earlier published observational data and personal observations of the author, made during the second Polish expedition to the Andes during Dec.-Jan. 1936-1937, is presented. General information on the geographical location and characteristic features of the area is followed by a discussion of precipitation, cloudiness, humidity, temperature, winds, atmospheric electricity, mirages and weather conditions in general. The majority of observations were made by the author with instruments belonging to the expedition (maximum and minimum thermometers, anemometers, rain gages and psychrometers) at the base at Tres Quebradas and during the journey. The author's observations are presented in an attached table, and cover temperature, wind force and direction and cloudiness. *Subject Headings: 1. Climate of Puna de Atacama 2. Expeditionary data 3. Puna de Atacama, Argentina.—A.M.P.*

7.2-242

551.582.2(774)

\*Baten, W. D. (*Mich. St. Col.*) and Eichmeier, A. H. (*U. S. W. B., East Lansing*), *Summary of weather conditions at South Haven, Michigan from 1926 to 1952. East Lansing, Michigan State College—Agricultural Experiment Station, Jan. 1955. 52 p. 24 charts. DWB*—A simple but effective analytical study of the climatic data for 1926-52 for South Haven (on the S.E. shore of Lake Michigan, about 300 yds inland). Most of the data are presented in the

form of full page graphs or histograms. Temperature (maximum, minimum and daily), precipitation, probabilities of no precipitation or specified amounts, duration of dry and wet spells, snowfall data of several kinds, frost, cloudiness, sunshine, etc. are presented on a daily, weekly, monthly and year-to-year basis. Brief text accompanies each chart. The lake influence is stressed. *Subject Headings:* 1. Climatic summaries 2. Climate of South Haven, Mich. 3. South Haven, Mich.—M.R.

7.2-243

551.582.2(792)

†Bennett, W. H.; Pittman, D. W.; Tingey, D. C. et al., *Fifty years of dry land research. Utah Agricultural Experiment Station, Logan, Bulletin*, 371, Sept. 1954. 81+34 p. 13 figs., 17 tables, 27 refs. DWB—On p. 14-20 of this comprehensive bulletin, describing work at the oldest continuously operating dry land experimental farm in America, is found a concise summary of climatic conditions at the Nephi Station (75 mi south of Salt Lake City, Utah, on an alluvial fan) based on records from 1903-1953 which are given on p. 68-72. Precipitation averages 12.65", ranging from 6" (1933-34) to 19" (1913-14) per crop year. May is the wettest and June the driest month. One-third of the annual precipitation comes in the spring (March-May). Yield of wheat per acre is shown to correlate well with annual and better yet with 2 year precipitation ( $r=+.3515$  and  $+.3829$ , respectively). The best seasonal correlation is with March-June precipitation ( $r=.36$ ), but with other seasons there is no significant relationship. Temperature, wind and evaporation are also analyzed and data presented; July evaporation is 11 times July precipitation. *Subject Headings:* 1. Climate of Nephi Station, Utah 2. Rainfall-wheat yield correlations 3. Long period records 4. Nephi, Utah. I. McAllister, D. R. II. Peterson, H. B. III. Sampson, I. G.—M.R.

7.2-244

551.582.2:628(756)

\*Brown, T. C. (N. Car. St. Col.), *Climatic data of North Carolina for use by engineers, architects and contractors. North Carolina. State College. Dept. of Engineering Research, Industrial Information Series Bulletin*, No. 5, June 1953. 24 p. 5 figs., 10 tables, 14 refs. Price: \$0.50. DWB—General climatic conditions in North Carolina are first outlined (topography, temperature, precipitation), and then engineering design data is presented in tables and on charts and discussed. Dry bulb temperature and precipitation and well water temperatures are shown on charts; and relative humidity 3 or 4 times a day, degree days and wind data given for each month for Asheville, Charlotte, Greensboro, Hatteras, Norfolk, Raleigh and Wilmington. Other design data are also tabulated. *Subject Headings:* 1. Climate of North Carolina 2. Engineering design data 3. Air conditioning 4. Heating and ventilating 5. North Carolina.—M.R.

7.2-245

551.582.2(777)

\*Shaw, Robert H.; Thom, H. C. S. and Barger, Gerald L., *The climate of Iowa, Pt. 1, The occurrence of freezing temperatures in spring and fall. Iowa. Agricultural Experiment Station-Iowa State College, Special Report*, No. 8, Aug. 1954. 88 p. 11 figs., numerous tables, 7 refs. Also Barger, Gerald L., *The climate of Iowa: Introduction. Ibid.*, No. 7, Aug. 1954. 7 p. DWB—An analytical study, supported by extensive data, showing dates of frost or of temperatures of 32°, 24° and 16°F or lower, in mean, in probability and in actual dates for each year of record (mostly 1890-1900 to 1952) for over 50 stations in Iowa. Charts for each occurrence show isarithms of mean dates of the event, or of the first or last occurrence in spring or fall, based on a remarkably even distribution of stations in Iowa. *Subject Headings:* 1. Climate of Iowa 2. Frost frequency data 3. Freezing temperature data 4. Iowa.—M.R.

## CLIMATIC CHANGES

7.2-246

551.583

Baxter, William J., *Today's revolution in weather. N. Y., International Economic Research Bureau*, 1953. 131 p. illus. DWB—A presentation of the thesis that the gradual warming up of climate will bring about a revolution in human activity especially in business and that weather determines human energy and is a fundamental determiner of human activity even to the extent of explaining why Germany has a higher steel output than France, etc.

The author ranges over a wide field of meteorological, biological, economic and political data (including the potential and economic development of the U.S.S.R.); but while the material is interestingly presented, it is often uncritically and naively interpreted. *Subject Headings:*

1. Climatic variations 2. Human activity.—I.L.D.

7.2-247

551.583

Schöve, D. Justin, *The Little Ice Age A. D. 1550-1850*. I.U.G.G. Association of Meteorology, Brussels, 1951, *Procès-Verbaux des Séances, Mémoires et discussion*, p. 188-189. put. 1953. 2 refs. DWB—Climax of the first phase of the "Little Ice Age" around 1651-80, of the second after 1740 and of the third around 1850. The Middle Age in Central Europe might have been slightly warmer than now. Recent warming found at Oslo. *Subject Headings:* 1. Climatic changes 2. Central Europe 3. Oslo, Norway.—A.A.

7.2-248

551.583..

†Rodewald, Martin, *Studien über klimatische Schwankungen. Ein Referat mit Anmerkungen*. [Studies on climatic variations. A review with remarks.] *Annalen der Meteorologie*, Hamburg, 6(11/12):365-379, 1953/54. 11 figs., 10 refs. DWB—Summary and discussion of J. GOLDBERG on climatic variations at Zagreb, Yugoslavia, (1862-90 to 1921-50) *Zagreb. Geofiz. Inst., Radovi*, Ser. 3, No. 3, 1953 (see 5.10-207, Oct. 1954, MAB); W. SCHWERTDFEGER and C. J. VASINO on secular variation of rainfall in Argentina, *Meteorol.* 4(3), 1954; E. L. DEACON on climatic change in Australia since 1880, *Austr. Journ. of Phys.* C 1953 (see 5.2-254, Feb. 1954, MAB); and two papers on climatic variations in Indonesia in relation to intertropical convergence. *Subject Headings:* 1. Climatic trends. I. Goldberg, J. II. Schwerdtfeger, W. III. Vasino, C. J. IV. Deacon, E. L.—C.E.P.B.

7.2-249

551.583.1

Rebman, Edwin J. (U. S. W. B., Walla Walla, Wash.), *A note on recent singularity studies*. *American Meteorological Society, Bulletin*, 35(10):498-499, Dec. 1954. 7 refs. DWB—A possible explanation of singularities involving feedback mechanisms is suggested and the importance of a fresh approach to the study of singularities and of their climatological significance is urged. *Subject Heading:* 1. Singularities.—I.L.D.

7.2-250

551.583.1

Wahl, Eberhard, *Die Erforschung der Gross-Singularitäten. Eine Aufgabe internationaler Zusammenarbeit auf dem Gebiet der Meteorologie*. [The investigation of large scale singularities. A task for international collaboration in meteorology.] *Umschau*, Frankfurt a.M., 55(20):616-617, Oct. 15, 1955. 2 figs. DLC—Singularities derived from very long series of observations are unsatisfactory; this is because a slow strengthening of the W-E circulation in the past 150 years weakened those associated with a low-index circulation and strengthened those associated with a high-index. Singularities can only be understood as part of the general circulation. *Subject Heading:* 1. Singularities.—C.E.P.B.

7.2-251

551.583.13:551.513.1

Wahl, Eberhard, "Singularitäten" des Wetterablaufs und die allgemeine Zirkulation der Atmosphäre. Was verbirgt sich hinter Begriffen wie: Eiseilige, Schafkälte, Altweibersommer und Weihnachtstauwetter? [Singularities in the course of weather and the general circulation of the atmosphere: what lies behind ideas like Ice Saints, Sheep cold, Old Wives Summer and Christmas thaw?] *Umschau*, Frankfurt a.M., 55(18):545-547, Sept. 15, 1955. 3 figs. DLC—Singularities may be transition stages through which the general circulation passes in changing from one phase to another. Their reality can only be decided on a world wide basis. The "January thaw" about Jan. 21 in northeastern U. S. coincides with cold days in Germany and is due to a low index and the poleward advance of the subtropical anticyclonic belt. The summer monsoon in Europe and U. S. represents a high index and similar connections can be shown for other singularities. *Subject Headings:* 1. Singularities 2. Atmospheric circulation anomalies.—C.E.P.B.

7.2-252

551.583.3

Manley, Gordon, **Climatological survey of the retreat of the Laurentide ice sheet.** *American Journal of Science*, New Haven, Conn., 253(5):256-273, May 1955. 2 figs., 37 refs. DWB—For glaciers in temperate latitudes the altitude of the firn line depends on mean temperature during the ablation season (June to Sept.) and secondarily on precipitation. This dependence can be used to estimate the climatic conditions prevailing during the later phases of the Laurentide ice sheet since the Wisconsin maximum. The trends of present-day June-Sept. mean isotherms correspond with the principal drift borders in both North America and northwestern Europe, with similar modifications toward the Atlantic in both regions. These considerations give independent support for correlating Fennoscandian moraines with the Mankato moraine, and permit deductions regarding climatic conditions prevailing near the ice and the time of revival of mountain glaciation in New England and elsewhere. Moreover, height of snowline, mountain glaciation, and the location of the ice-sheet margin can be related to past summer temperatures as indicated by vegetation. As the Laurentide ice sheet was much larger than that of Scandinavia, it took longer to disappear; its post-Makato fluctuations can perhaps be correlated with minor fluctuations during the earlier Atlantic phase in Europe, before the thermal maximum. *Subject Headings:* 1. Glacier retreat 2. Glacial periods

3. **Climatic changes.**—*Author's abstract.*

### MICROCLIMATOLOGY

See also: **Plant & climatology** (Klika et al.), 7.2-8; **Plant temp. measurem.** (Biel et al.), 7.2-90; **Nocturnal temp. inversion** (Ambach), 7.2-146; **Slope microclimatology** (van't Woudt), 7.2-234; special bibliography on **Climate of Enclosed Spaces**, p. 211.

7.2-253

551.573:551.584.41

\*Rowe, P. B. (*Calif. Forest and Range Exp. Station, Berkeley*), **Effects of the forest floor on disposition of rainfall in pine stands.** *Journal of Forestry*, Wash., D. C., 53(5):342-348, May 1955. 6 figs. (incl. photos), 7 tables, 6 refs. DWB, DLC—Results of a series of experiments carried out in the forests of the Sierra Nevada near Bass Lake and North Fork, Calif. (Ponderosa Pine) and at Berkeley, Calif. (Monterey Pine), in 1941-45, by means of litter pans, lysimeters and moisture samples. The purpose was to measure evaporation from forest floors and their influence on runoff, percolation and evaporation from soil. Evaporation varied with depth of litter, deviation of snow cover and storm characteristics. Annual evaporation averaged 1.5" from floor 1.0" deep; 2.3" from 2.7" deep, 2.6" from 3.6" deep. Surface runoff was greater and percolation less from bare than from covered soils. Percolation starts sooner and lasts longer from covered soils. A floor  $\frac{1}{2}$ " deep is almost as good as for deeper floors, and much better than from lesser depths. *Subject Headings:* 1. Forest microclimatology 2. Forest floor influences 3. Evaporation from forest floors 4. Sierra Nevada, Calif.—M.R.

### CLIMATIC CLASSIFICATION

See: **Local winds** (van Eimern), 7.2-183.

### BIOCLIMATOLOGY

See also: **Agric. met.** (Germany. Deutscher Wetterdienst), 7.2-36; special bibliography on **Climate of Enclosed Spaces**, p. 211.

7.2-254

551.586:008

Mämecke, Karlheinz, **Welches Klima brachte unsere Kultur hervor?** [In which climate did our civilization develop?] *Naturwissenschaftliche Rundschau*, 8(10):403, Oct. 1955. 1 table. DWB—Climatic summaries are given for 9 centers of ancient civilization for comparison with Berlin. All have slight rainfall. In the lowlands the range from warmest to coldest month is large and the temperature very variable. *Subject Headings:* 1. Bioclimatology 2. **Climatology.**—C.E.P.B.

7.2-255

551.586:612.014.45

†Bass, David E. et al., **Mechanisms of acclimatization to heat in man: the effect of prolonged heat exposure on body water distribution and electrolyte and nitrogen metabolism**. U. S. Quartermaster Corps. *Research and Development Div., Environmental Protection Branch Report*, No. 214, June 1953. 72 p. 20 figs., tables, 97 refs. DWB—Five young healthy soldiers (race not specified) were acclimatized to heat by living and working conditions in a chamber kept at a temperature of 120°F during the daytime and 100°F during the night. The following measurements were made during control, experimental and recovery periods: antipurine thiocyanate and T-1824 "spaces," sweat production; sweat concentration of Na, Cl, K, N, and creatine, nitrogen and electrolytic balances; indices of adreno-cortical activity: pulse rates and rectal temperatures during exercise. A review of the literature dealing with the physiological and biochemical processes of acclimatization to atmospheric heat and a description of the experimental procedure are presented. The physiological and biochemical data are given as means of the five subjects. *Subject Headings: 1. Heat tolerance 2. Acclimatization 3. Heat effects on man.—I.L.D.*

7.2-256

551.586:612.12

Wilson, Ove, **Physiological changes in blood in the Antarctic: a preliminary report**. *British Medical Journal*, 1953, Pt. 2:1425-1428. fig., 19 refs. DSG—On the Norwegian-British Swedish expedition to Queen Maud Land in 1949-52 observations of basal metabolic rates and blood tests were made on 14-15 subjects to determine changes during acclimatization. Red cell counts and adrenaline showed no changes. Haemoglobin showed a seasonal fluctuation. Blood sugar and white cell counts fell during acclimatization. After acclimatization blood sugar increased to 9% above normal but white cell counts remained 25% below normal. *Subject Headings: 1. Acclimatization 2. Blood chemistry 3. Antarctica.—C.E.P.B.*

7.2-257

551.586:613.1

Hampel, D., **Einige Schwülebeobachtungen. Untersuchungen über die Schwülegrenzen**. [Some observation of sultriness. Investigations of the sultriness limit.] *Angewandte Meteorologie*, 2(5):143-146, July 1955. fig., 2 tables, 8 refs. DWB, DLC—From July 16 to Aug. 7, 1953, 24 subjects in a room in a medical institute were asked at 8 and 13 h for their impressions of sultriness, and observations of temperature, cooling power (quotient moist/dry) and humidity were made. K. SCHARLAU's thermal sultriness index was calculated. Opening the window decreases the feeling of sultriness. Results are tabulated. A day which all found sultry had the highest cooling power quotient (3.85) and equivalent temperature (56.1°). The equivalent temperature gave the most definite results. *Subject Heading: 1. Sultriness.—C.E.P.B.*

## ENVIRONMENTAL INFLUENCES

7.2-258

551.588:551.578.46

551.588.2

551.588.0

Fel'dman, I.A. I., **Issledovaniia zavisimosti uslovii mestnoi pogody ot glavneishikh elementov podstilaiushchei poverkhnosti na ravnine Evropeiskoi territorii Soiuza**. [Investigations of the dependence of local weather conditions on the main elements of the underlying surface in the plain of European U.S.S.R.] *Vsesoiuznoi Geograficheskii S'ezd*, 2nd, Leningrad, 1948, *Trudy*, 2:240-241, 1948. DLC—Presents results of three investigations. The first, dealing with the influence of snow cover on local weather in spring, showed that the process of local weather formation in a snow covered region, and beyond it, proceeds differently in conditions of dissimilar air masses. Above the snow cover a cool type of weather prevails with moderate winds and a large temperature range. Outside of the snow cover the wind is also moderate, the amplitude is large, but the weather is considerably warmer. The second establishes the dependence of precipitation on terrain conditions. The prevailing opinion that the amount of precipitation is conditioned by absolute height of the locality has been found to be wrong in regard to plains. The third investigation studied the influence of the locality on the formation of some types of weather in the north of the European forest zone. A positive correlation of frequency of rainy and cloudy weather with the degree of density of the forests was found. *Subject Headings: 1. Snow cover effects 2. Topographic influences 3. Forest influences 4. Local climates 5. U.S.S.R.—A.M.P.*

7.2-259

551.588.2(44):581.5

Rey, Paul, *Sur une méthode d'analyse écologique des cartes de la végétation*. [A method for the ecological analysis of vegetation maps.] *Académie des Sciences, Paris, Comptes Rendus*, 238(10):1158-1160, March 8, 1954. 2 figs. DWB—The frequency of a given kind of trees is plotted versus altitude for north and south exposures near Perpignan. Another diagram shows the preference of each kind of tree for a given annual precipitation and altitude as a substitute for temperature. The analysis is based on new vegetation maps (1:200,000) issued by the Centre National de la Recherche Scientifique. *Subject Headings*: 1. Plant ecology 2. Vegetation maps 3. Mountain climatology 4. Perpignan, France.—A.A.

7.2-260

551.588.7:72

Zawadil, R., *Über die Anpassung der Bauweise an die Klimaverhältnisse*. [Adaptation of building techniques to climatic conditions.] *Wetter und Leben*, Vienna, 6(7/9):169-170, 1954. MH-BH—Summary of sections of EGLI, ERNST, *Die Neue Stadt in Landschaft und Klima* (see item 3G-243, July 1952, MAB), dealing with climatic influence upon man and on the types of housing adapted to the tropics, sub-tropics, arid regions, temperate zone, and the sub-arctic zone. *Subject Headings*: 1. Climatic influences 2. Building design 3. Tropical housing.—I.L.D.

## SYNOPTIC CLIMATOLOGY

7.2-261

551.589.1

Band, G. (*Met. Inst., Köln Univ.*), *Ist der Main eine Wetterscheide?* [Is the Main a weather divide?] *Zeitschrift für Meteorologie*, Berlin, 9(1):14-21, Jan. 1955. 9 figs., 5 refs. DWB, DLC—Dependency of the mean frequency distribution of various weather phenomena and climatic characteristics upon the latitude of southern and northwest Germany is investigated. Fewer fronts are found in regions south of the Main than in those north of the Main. Southwest Germany is characterized by a greater number of days with high pressure situations. It also has fewer rainy days but more bright days, summer days, storm days than west and northwest Germany. The annual mean distribution of cloudy days and sunshine duration is uniform in all areas. The fact that the variation in mean frequency of frontal days with high pressure velocities, etc. proceeds in a north-south direction endows the 50° latitude, in the vicinity of the Main, with the character of a weather divide. *Subject Headings*: 1. Synoptic climatology 2. Frequency distributions 3. Main River, Germany.—I.L.D. (*Trans. of author's abstract.*)

7.2-262

551.589.1

†‡\*Cadež, M., *Analiza vremena u FNR Jugoslaviji u 1951 godini*. [Analysis of weather in Yugoslavia in 1951.] *Yugoslavia. Hidrometeorološka Služba, Rasprave i Studije, Memoires*, No. 5, 1954. 39 p. 24 figs., 12 tables, 23 refs., 6 eqs. In Croatian; French summary p. 37-39. DWB—This analytical summary of weather in Yugoslavia during 1951 takes up the dynamic types of weather at various stations in each season, synoptic types (29) illustrated by examples throughout the year, and frequency thereof and, finally, cold "invasions" in Yugoslavia. Numerous synoptic and isarithm charts are included, and frequency tables are interspersed. *Subject Headings*: 1. Synoptic climatology 2. Annual meteorological reports 3. Yugoslavia.—M.R.

## MISCELLANEOUS

## COSMIC INFLUENCES

See also: Comm. for Study of Solar & Terr. Relations (I.C.S.U.), 7.2-19; Comm. for Study of Solar & Terr. Relations (d'Azambuja), 7.2-20; Eclipse phenomena (Minnis), 7.2-126.

7.2-263

551.590.23:523.8

Abell, George O. (*Mt. Wilson and Palomar Observatories*), *The matter between the stars*. *Griffith Observer*, Los Angeles, 19(7):74-87, July 1955. photos. DWB—Among the numerous

aspects of interstellar matter treated in this article are interstellar hydrogen which emits on a 21 cm wave length (radio stars) and interstellar dust which causes dark patches. The former emits radiation and the latter scatters or cuts down radiation from stars beyond, but the scattering is not as Rayleigh scattering in the atmosphere (4th power of the wave length) but as the first power of  $\lambda$ . The dust is composed of frozen hydrogen compounds or other nonmetallic substances which range from 1/30,000 to 1/50,000 of an in. in diameter. *Subject Headings: 1. Interstellar dust 2. Interstellar hydrogen 3. Radio astronomy.—M.R.*

7.2-264

551.590.24

Botley, Cicely M. and Bower, S. Morris, **Solar eclipse, 30 June 1954.** *Weather*, 10(10):357-358, Oct. 1955. fig. DWB—CICELY BOTLEY describes general observations from Lysekil on southwest coast of Sweden. The temperature fell from 61°F to 55°F. BOWER gives thermograph records at Huddersfield and Unst, Shetland. *Subject Heading: 1. Solar eclipse effects.—C.E.P.B.*

## VISIBILITY

7.2-265

551.591.1:523.8

Smith, Alex G. (*Fla. Univ., Dept. of Physics*), **Daylight visibility of stars from a long shaft.** *Optical Society of America, New York, Journal*, 45(6):482-483, June 1955. fig., 8 refs. DLC—Photometric measurements indicate that the presence of a long shaft causes no real change in the contrast of a star against the daytime sky. Moreover, physiological data suggests that contrary to popular opinion such a shaft may actually have an adverse effect on the daylight visibility of stars. *Subject Headings: 1. Daytime visibility of stars.—Author's abstract.*

7.2-266

551.591.361(261.2)

Schindler, Gerhard, **Beobachtung aussergewöhnlicher Feuersicht.** [Unusual visibility of lights.] *Wetterlotse*, No. 92:186-187, Sept. 1955. DLC—Quotes visibilities of 44-64 naut mi on night of June 5-6, 1955 from a ship in the southern North Sea, with accompanying weather. *Subject Headings: 1. Exceptional visibility 2. North Sea.—C.E.P.B.*

## OPTICAL PHENOMENA

*See also: Twilight brightness measurem.* (Scheer), 7.2-153; *Sky brightness & polarization* (Barber), 7.2-155.

7.2-267

551.593.1

Kebblewhite, Alexander W. and Gibbs, W. J., **Unusual phenomenon observed from East Sale.** Letter to the Director, Meteorological Branch, and reply by the Director, W. J. Gibbs. *Australian Meteorological Magazine*, Melbourne, No. 4:32-34, Aug. 1953. eqs. DWB—Observer at East Sale, Australia reported bright thin streak of light parallel to eastern horizon at 0430, and continuing until 0630 when sun rose. GIBBS replies that it was probably atmospheric refraction, as beam was in direction of sun when latter rose. *Subject Headings: 1. Refraction phenomena 2. East Sale, Australia. I. Gibbs, W. J.—M.R.*

7.2-268

551.593.11:535.3

Ashmore, S. E., **North Wales road-mirage.** *Weather*, 10(10):336-342, Oct. 1955. 4 figs. photo, 6 refs., 5 eqs. DWB—Description of a mirage seen almost every day between Feb. 18 and Oct. 30 at Wrexham, beginning at solar altitude about  $24\frac{1}{2}^\circ$ , except in snow, heavy rain or fog, whatever the temperature. It continues until up to 4 hrs after sunset. It is calculated that it is caused by a large temperature gradient in an air layer only about  $\frac{3}{4}$ " thick. The albedo of cloud preventing the mirage is calculated as 22-50% and of fog 12.8%. *Subject Heading: 1. Mirage theory.—C.E.P.B.*

7.2-269

551.593.5:517.3

Piaskovskaia-Fesenkova, E. V., **Uchet rasseianiia sveta vysshikh poriadkov.** [Calculation of the highest orders of light scattering.] *Akademiia Nauk SSSR, Doklady*, 102(3):503-506, 1955. 2 figs., 4 refs., 20 eqs. DLC—The author derives integral equations for calculating on the basis of observational data the atmospheric indices of light scattering from the influence

of light scattering of the highest orders. These equations are

$$B = E_0 m p^m \left[ -\frac{\mu_1}{\tau_1} \ln \rho + \frac{1}{4\pi} (\tau - \tau_1) \right] E = z$$

$$B = F_0 \frac{M}{M-m} (P^m - P^m) \left[ \frac{\mu_1}{\mu_2} + \frac{1}{4\pi} \left( \frac{\tau}{\tau_1} - 1 \right) \right] E \neq z.$$

*Subject Headings:* 1. Scattering of light 2. Integral equations.—I.L.D.

7.2-270

551.593.5

Saxton, David S., **Lectures on the scattering of light.** Notes prepared by Robert S. Fraser. California Univ. at L. A., Meteorology Dept., Contract AF 19(122)-233, Scientific Report, No. 9, May 1955. 100 p. 8 figs., 11 refs., 94 eqs. DWB—The exact (Mie) theory for the scattering of a plane wave by a dielectric sphere is presented in more detail and using somewhat more modern methods than is customary in the literature. Since this infinite series solution is computationally impractical for large spheres, another formulation is given in terms of an integral equation valid for a bounded but otherwise general array of scatterers. This equation is applied to the scattering by a single sphere, and several methods are suggested for approximating the scattering cross-section in closed form. Finally, a tensor scattering matrix is introduced, in terms of which some general scattering theorems are derived. The application of the formalism to multiple scattering is briefly considered. *Subject Headings:* 1. Mie theory 2. Scattering of light. I. Fraser, Robert S.—*Author's abstract.*

7.2-271

551.593.51

Varley, George C., **Seeing is believing.** *Weather*, 10(10):355-356, Oct. 1955. DWB—Describes green flash seen over sea fog from about 500 ft a.s.l. on a morning of unusual refraction. *Subject Heading:* 1. Green flash.—C.E.P.B.

7.2-272

551.593.55:535.33

Hunten, D. M., **A comparison of several systems for photometry of the twilight sodium emission.** Saskatchewan. Univ. Physics Dept., Contract AF 19(122)-152, Scientific Report, AR-21, June 1955. 14 p. table, 6 refs., eqs. DWB—A number of systems which might be suitable for routine photometry of the twilight sodium emission are compared with the auroral spectrometer now used. If it is required that the photomultiplier be used without refrigeration, the best system is one using a sodium vapor absorption tube; one with a high-order wedge interference filter is also worth investigation. *Subject Headings:* 1. Photometric twilight sky measurement 2. Sodium emission 3. Spectrophotometers.—*Author's abstract.*

7.2-273

551.593.6:778.6

Volz, Friedrich (*Inst. für Meteorologie und Geophysik, Mainz Univ.*), **Die Farbenphotographie in der atmosphärischen Optik, 3, Wolkenkränze, Glorien und Regenbogen.** [Color photography in atmospheric optics, Pt. 3, Cloud haloes, coronas and rainbows.] *Photographie und Wissenschaft* (pub. by Agfa), 4(1), 1955. 6 p. photos (in color), ref. Abstracted from reprint. GB-MO—Colors in coronas, rainbows, clouds, etc. are due to different refraction of light of different wavelengths in collections of uniform water drops. Some excellent colored photos are reproduced as examples. *Subject Headings:* 1. Optical phenomena 2. Color photography.—C.E.P.B.

7.2-274

551.593.61/2

Malkus, W. V. R. (*Woods Hole Oceanog. Inst.*), **Rainbows and cloudbows.** *Weather*, 10(10):331-335, Oct. 1955. 6 figs., 2 photos. DWB—A photo of a rainbow is analyzed; supernumeraries indicate a narrow range of drop size (15% on either side of mean). It is suggested that artificial bows could be used to investigate drop size distribution. The theory of the rainbow is discussed and variation of light intensity with angle of viewing is calculated for different ratios of drop radius to wavelength. These are confirmed by laboratory tests and by a photo of a natural cloud bow by V. SCHAEFER. *Subject Headings:* 1. Rainbows 2. Cloudbows.—C.E.P.B.

## ELECTRICAL PHENOMENA

See also: Wind effects (Chapman), 7.2-185.

7.2-275

551.594.1

\*†Öpik, E. J., Meteor radiation, ionization and atomic luminous efficiency. *Royal Society of London, Proceedings, Ser. A*, 230(1183):463-501, July 12, 1955. 32 tables, 33 refs., 38 eqs. DWB—The spectra and luminous emission of meteor radiation are studied theoretically and empirically. The radiation is mainly line emission due to impact excitation of meteor atoms partly to recombination of atomic ions. Luminous efficiencies are calculated for photographic visual, red and other radiations. Tables are given for facilitating calculations. *Subject Headings: 1. Meteor ionization trails 2. Meteor trails.*—C.E.P.B.

7.2-276

551.594.14:662.2:539.

Eisenbud, Merrill and Harley, John H. (both, U. S. Atomic Energy Commission, N. Y.) **Radioactive fallout in the United States.** *Science*, Wash., D. C., 121(3150):677-680, May 13, 1955. 2 figs., 11 refs. DLC—During 1952, 1953 and 1954 atomic tests in Nevada and the Pacific, a network of 89 monitoring stations was maintained in the U. S. to obtain samples of radioactive fallout. The samples were obtained on 1 ft<sup>2</sup> gummed surfaces mounted on a frame 3 ft above the ground. The coating is adhesive when wet, so dust entrapped in rain drops is collected. The films are changed each day and sent to the AEC laboratory in N. Y. where the samples are ashed at 550-600°C and the radioactivity counted with an accuracy of  $\pm 10\%$ . Network stations are listed and manner of testing illustrated graphically. Various components such as Sr<sup>89</sup> and Sr<sup>90</sup> are discussed as to half-life, manner of production and fallout. Map of U. S. shows cumulative fallout in U. S. from spring of 1951 to end of 1954. Values range from 21 millicuries/sq mi in Arizona to 120 in N. Mexico. Nevada is omitted from data. Examples of heavy fallout at great distance are cited. None of the values thus far measured are considered anywhere near biologically dangerous levels. *Subject Headings: 1. Radioactive fallout 2. Radioactive fallout networks 3. Atomic explosion effects 4. United States.*—M.H.

7.2-277

551.594.22:632.18

Schaefer, Vincent J. (Munitalp Foundation, Inc., N. Y.) **Thunderstorms and Project Skyfire.** *New York Academy of Sciences, Transactions*, Ser. 2, 17(6):470-473, April 1955. DLC—The studies of lightning fires (which do more damage than human fires in the Northern Rocky Mountains) inaugurated years ago by the late Harry Gisborne of the U. S. Forest Service have been extended (since 1948) by SCHAEFER and numerous forest lookouts on mountain peaks in the region. Project Skyfire started in 1953 to make studies of cumulonimbus clouds, the favorite breeding grounds for these storms (certain ranges or peaks) and jet stream clouds which give evidence of future storm conditions, has continued this work. Time lapse pictures—sometimes taken synchronously at 2 peaks 200 mi apart, and a careful observation program have been undertaken under the author's direction. *Subject Headings: 1. Lightning fires 2. Thunderstorm research 3. Jet stream cloud photography 4. Project Skyfire 5. Forest fires. I. Gisborne, Harry.*—M.R.

## AURORAS

7.2-278

551.594.51:523.

Alfvén, H. (Royal Inst. of Tech., Stockholm), and Chapman, S. (Queen's College, Oxford) **Theories of the aurora.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 30:391-401, July 1954. 19 refs. MH-BH—Several types of auroral theory are discussed but the most likely one is said to involve the assumption that the upper atmosphere participates in the auroral discharge, so that the latter is not independent of atmospheric winds, etc. as would be the case if the aurora were caused by solar corpuscles alone. The corpuscular emission field from the sun may carry with it a magnetic field from the sun (much more intense than assuming the inverse cube law) which could induce an electric field strong enough to produce a discharge. Interplanetary winds may, therefore, exist in connection with magnetized plasma or beams from the sun and aurora or magnetic disturbances may be indications of the force of this wind. A lively discussion follows. *Subject Headings: 1. Auroral theories 2. Interplanetary winds.*—M.R.

7.2-279

551.594.51:535.33

Hunten, D. M., **Some photometric observations of auroral spectra.** *Journal of Atmospheric and Terrestrial Physics*, London, 7(3):141-151, Sept. 1955. 2 figs., 6 tables, 22 refs. DWB—Photoelectric spectra giving relative and absolute measures of the more prominent auroral features are illustrated and discussed. "Observations of the H $\beta$  seem to indicate more erratic behavior than has been assumed. The intensity of the N II lines 5001-5 Å shows little or no excitation by helium ions. A very intense feature observed in Type B red aurora appears to be due to sodium. The vibrational development of the N $_2^+$  first negative system indicates electron excitation from the ground state of N $_2$  at a temperature of 0-700°K. The results show the spectrometer to be useful for intensity measurement and the observation of short-lived effects." *Subject Heading: 1. Auroral spectra.—From author's abstract.*

7.2-280

551.594.51

Jones, A. Vallance, **An atlas of the auroral spectrum.** Saskatchewan. Univ. Physics Dept., Contract AF 19(122)-152, Scientific Report, AR-20, [1955?] 8 p. 5 figs., 3 refs. Append. DWB—This report comprises a set of microphotometer tracings of photographs of the auroral spectrum obtained at Saskatoon from 1952 to 1954. The positions of molecular bands and atomic lines known or claimed to be present in the auroral spectrum have been drawn in on the charts. The relative intensities for L-S coupling of the lines within the multiplets have been indicated. *Subject Headings: 1. Auroral spectra 2. Auroral atlases 3. Saskatoon, Saskatchewan.—Author's abstract.*

7.2-281

551.594.51:551.521.4

Vassy, A. and Vassy, E. (*Lab. of Phys. of the Atm., Paris*), **Activité aurorale aux latitudes moyennes.** [Auroral activity in the middle latitudes.] *Indian Journal of Meteorology and Geophysics*, Delhi, V. 5, Spec. No. P. 137-140, Dec. 1954. fig., 10 refs. In French; English summary p. 137. DWB—Available observations by various workers concerning the variations in the intensities of the three principal lines 5577, 5893 and 6300 Å in the auroral and night sky spectra are first summarized. The existence at geomagnetic latitude 70° of a very sharp maximum in the frequency of days with auroral activity is emphasized. It is suggested that, instead of frequency (in %) of days, it would be preferable to adopt as a criterion the product of the intensity of auroral light by the time during which it occurs. The general conclusion reached is that, in the middle latitudes, the luminescence of the night sky probably has a component arising out of feeble auroral activity. It would be desirable to make a systematic study of this question in a region of little cloudiness with instrumental equipment capable of giving an instantaneous response to night sky luminescence. *Subject Headings: 1. Auroral intensity variations 2. Night sky spectrum 3. Auroral latitudes.—Authors' abstract.*

7.2-282

551.594.52

Elvey, C. T.; Leinbach, Harold; Hessler, Joan and Noxon, John (*all, Univ. of Alaska*), **Preliminary studies of the distribution of auroras in Alaska.** *American Geophysical Union, Transactions*, 36(1):390-394, June 1955. 3 figs., 8 refs. DWB—The analysis of auroral observations for 1951-53 from five stations spread over Alaska shows a zone at geomagnetic latitude 68° for which the incidence of auroras is independent of magnetic activity. At geomagnetic latitudes south of 67°, the incidence of auroras is markedly dependent upon magnetic activity. *Subject Headings: 1. Auroral distribution 2. Alaska.—Authors' abstract.*

7.2-283

551.594.53:550.38:621.396.11

Gerson, N. C., **Diurnal variation in auroral activity.** *Physical Society of London, Proceedings, Ser. B*, 68(7):408-414, July 1, 1955. 3 figs., 19 refs. DWB—The variation deduced from analysis of radio contacts between amateurs in N. America (50-60° geomagnetic N) in 1949-51 by waves incident obliquely to the ionized aurora showed a strong maximum at 21 h 75th W meridian time, about the time of greatest auroral activity; 86% of the contacts fell between 17 and 24 h. The period of contact was longest in April, May and Oct. It does not seem to depend on geomagnetic control. *Subject Headings: 1. Diurnal auroral variations 2. Auroral ionization.—C.E.P.B.*

## RADIO METEOROLOGY

7.2-284

551.594.7:621.396.029.

Bellaire, F. R. and Arvola, W. A. (both, *U. S. Navy Electronics Lab., San Diego*), **Prediction of diurnal field strength patterns by synoptic methods.** (In: Conference on Radio Meteorology, Univ. of Texas, Austin, Nov. 9-12, 1953, Proceedings, v. [1]:III-4, pub. 1953. 7 p. 4 figs. **DLC, DWB**—Best VHF-UHF propagation to a point beyond the horizon occurs when a shallow layer of moist air lies under a dry layer and the worst conditions occur when air is dry or moist (unstable) to great heights. Southerly flow from Gulf of Mexico, weak pressure gradient, clear skies, veering winds, laminar structure (from Raob data), large diurnal temperature range, fog at night, and light winds give highest signals. Seven flow or air mass classes were designated for correlation with signal strength. Large diurnal variations in signal strength is characteristic of high intensity signals (at night) and low variations with low intensity. Air mass changes are apt to produce greatest deviations of actual from predicted values of diurnal curve. *Subject Headings: 1. Tropospheric propagation 2. Microwave propagation forecasts.*—*M.R.*

7.2-285

551.594.7:621.396.811

Watts, J. M. (*Central Radio Propagation Lab., Natl. Bureau of Standards, Wash., D. C.*) **Oblique incidence propagation at 300 kc using the pulse technique.** *Journal of Geophysical Research*, 57(4):487-498, Dec. 1952. 7 figs., 6 refs. **MH-BH**—The results of an oblique incidence pulse experiment at 300 kc, using a path length of 1185 km over sea-water, are presented. These consist of median time delays of sky wave vs surface wave for March, April and May, 1951, together with pulse envelope photographs of typical pulse groups, continuous film recordings of surface- and sky-wave pulses, a plot of sunrise transition times, and a discussion of the sunrise conditions. *Subject Heading: 1. Radio transmission.*—*Author's abstract.*

## ACOUSTICAL PHENOMENA

7.2-286

551.596.4

Groves, G. V., **Geometrical theory of sound propagation in the atmosphere.** *Journal of Atmospheric and Terrestrial Physics*, London, 7(3):113-127, Sept. 1955. 4 figs., 14 refs., 52 eqs. **DWB**—The propagation of sound in an inhomogeneous moving medium, e.g., the atmosphere, is treated along the lines of geometric optics. A solution is obtained by assuming that the velocity of sound and the wind velocity are functions only of height. This is applied to the case of a ground level source reflected by a temperature inversion in the upper atmosphere, and expressions are found for the distance at which it returns to earth and the time of travel. The results agree with observations of zones of abnormal audibility. The effect of upper winds is briefly considered. *Subject Heading: 1. Acoustical propagation.*—*C.E.P.B.*

# PART II. ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF ENCLOSED SPACES (CRYPTOCLIMATES)

By: *C. E. P. Brooks and G. J. Evans*

## INTRODUCTORY NOTE

The purpose of this bibliography is to show the relationship between various meteorological elements and the climate of enclosed or semi-enclosed spaces, particularly those occupied by men or animals. Various aspects of building design, devices for modifying indoor climates, controlled laboratories for simulating climatic or weather conditions, and methods for measurement of meteorological elements affecting indoor climates are also considered. The bibliography is far from exhaustive, especially in the broad fields of (a) Ships hold climates, (b) Air conditioning, heating and ventilating, and (c) Storage (barn, shed, greenhouse, rick, or crib) microclimates. Many important contributions have not been located in time to include in this compilation. However, the following subject outline gives some idea of the variety and scope of subjects that are embraced by the field of cryptoclimatology (climate of enclosed or semi-enclosed spaces), and a representative sample of the world's literature on the subject which would lead a researcher to further references on any desired sub-subject. (The majority of references were supplied by G. J. Evans, of the Air Ministry, Met. Office Library, and a number of supplementary references by Dr. H. E. Landsberg, of the U. S. Weather Bureau).

For additional material on construction, lighting, heating and air conditioning see Sec. F of the *Annotated Bibliography on Industrial Meteorology*, *MAB*, 5(10):1187-1230, Oct. 1954.

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1868

7B-1

551.510.41

Smith, R. Angus, *On the composition of the atmosphere.* *Manchester Literary and Philosophical Society, Memoirs*, 3rd Ser., 3:1-56, 1868. tables, refs. **DLC**—Ample data of air analyses are presented in tables and discussed. Carbon dioxide content is shown for various places on the globe, in open land, in forests, in hospitals and so on. The variations caused by different factors are discussed and the article concludes with the assertion that it is important to observe minute fractions in the amount of carbon dioxide in the atmosphere. (*Same item as 3B-24, Feb. 1952, MAB.*) *Subject Headings:* 1. Carbon dioxide in forest air 2. Carbon dioxide in hospitals.—*N. A. Zikeev.*

1872

7B-2

551.510.41(42)

Weaver, Richard, *On the quality of atmospheric air in public and private buildings in Leicester.* *Lancet*, London, 2:7. 150, 223, 1872. table. **DLC**—A very interesting survey of the content of carbon dioxide in various rooms. Results given in figures for 15 places vary from 0.81% in prisoner's cell to 3.09% in national school. In the hall of Crown Court it was 1.96% but in the gallery, 2.90%. The higher percentage of carbon dioxide in the gallery testifies to the fact of its ascension with aerial currents and that there is no tendency towards accumulation in the lower strata of air from superior specific gravity as has been sometimes argued. (*Same item as 3B-30, Feb. 1952, MAB.*) *Subject Headings:* 1. Carbon dioxide in buildings 2. Urban influences 3. Leicester, Eng.—*N. A. Zikeev.*

1874

7B-3

551.510.41

Cameron, Charles A., *Amount of carbonic acid in the air of canal boats.* *Chemical News*, London, 30:169-170, Oct. 1874. **DLC**—The amount of carbon dioxide was measured in several cabins of the boat. The results ranged from 0.098 to 0.95%. (*Same item as 3B-35, Feb. 1952, MAB.*) *Subject Headings:* 1. Carbon dioxide in boats 2. Ships' cabin microclimates.—*N. A. Zikeev.*

1879

7B-4

551.510.41(73)

Lupton, N. T., *Sanitary conditions of air in public schools.* *Chemical News*, London, 39:180-181, 1879. table. **DLC**—Measurements of carbon dioxide in the air in the public schools of Nashville were made each day from 12.30 to 1.30 p.m. The results are shown in a table. (*Same item as 3B-51, Feb. 1952, MAB.*) *Subject Headings:* 1. Carbon dioxide in school buildings 2. Schoolroom microclimates 3. Nashville, Tenn.—*N. A. Zikeev.*

## 1902

7B-5

551.510.41

\*Clowes, Frank and Murphy, Shirley F., **Examination of the atmosphere of the central London Railway.** *London. County Council, [Publication] No. 615, [1902.]* 21 p. diagr., 7 tables. DLC—Chemical, physical and bacteriological examinations of the atmosphere have been made and results presented in: 1) "Report by the chemist" and 2) "Report by the medical officer of health." Measurement of carbon dioxide content made in various places (tunnels, coaches, post office elevators, etc.) are presented in tables. About 22% of the samples contained less than twice as much carbon dioxide as that found in outside air and 34% contained less than two and a half times as much. (Same item as 3B-140, Feb. 1952, MAB.) *Subject Headings:* 1. Carbon dioxide in indoor air 2. Tunnel microclimates 3. Railway car microclimates.—N. A. Zikeev.

## 1923

7B-6

551.552:69

Nunn, Roscoe, **Wind directions and the orientation of schoolhouses.** *Monthly Weather Review* 51:125-127, 1923. table. DWB—A statement of the prevailing winds in April-June, Sept., Oct in a number of U. S. cities and some remarks on the placing of windows to get the best ventilation (Same item as 3G-53, July 1952, MAB.) *Subject Headings:* 1. Building design 2. School microclimates 3. Wind direction effects on ventilation.—C.E.P.B.

7B-7

551.524

Sutton, L. J., **Note on indoor temperatures in Cairo during the summer of 1922.** *Royal Meteorological Society, Quarterly Journal*, 49:277-278, 1923. DWB—Author briefly reports results of the record he kept of maximum and minimum temperatures indoors in Cairo, July to Oct. 1922. (Same item as 2J-98, Oct. 1951, MAB.) *Subject Headings:* 1. Microclimatology 2. Indoor temperatures 3. Cairo, Egypt.—H. P. Kramer.

## 1924

7B-8

551.5:72

Lloyd, Nathaniel, **Aspects of houses in relation to wind, rainfall and sunshine.** *Royal Institution of British Architects, Journal*, 31:633-644, 1924. figs., table. DLC—A discussion of best aspects for living rooms of a house in Richmond, Falmouth, Aberdeen and Valentia (Eire) taking account of amount of rainfall with winds of different directions, and hourly duration of sunshine at different seasons. In Britain a S.E. aspect is favored. (Same item as 3G-60, July 1952, MAB.) *Subject Headings:* 1. Building design 2. Rain 3. British Isles.—C.E.P.B.

## 1926

7B-9

551.582.3(4):69

\*Great Britain. Ministry of Town and Country Planning, Research Maps Office, **Europe selected climatic factors relevant to structural and insulation requirements of houses.** 1926. 8 p. 10 large fold. maps. Mimeo. The maps show for western and central Europe: 1, 2, 3, Temperature, mean annual maximum, mean annual minimum, mean annual extreme range. 4, 5, 6, Number of months below 12°C., 6°C., 0°C. 7. Assessment of annual domestic fuel requirements. 8. Average annual number of days with wind of force 8 or over. 9. Generalized snow conditions. 10. Generalized maximum depth of frost penetration. *Subject Headings:* 1. Climatic charts 2. Building construction 3. Europe.—C.E.P.B.

## 1927

7B-10

551.521.16:628.92

Great Britain. Department of Scientific and Industrial Research. Illumination Research. **Penetration of daylight and sunlight into buildings.** Its *Technical Paper*, No. 7, 1927. 21 p. 1 figs., 15 refs. GB-MO—"Sill ratio" is defined as illumination at a point in a room in percent of that on the window-sill of the room. Method of calculation is described. The minimum tolerable in moderately dull weather (250 ft candles on sill) is estimated as 0.4% or 1 ft candle ("grumble point"). 0.4-1% is adequately lit. Effects of reflections from matt surfaces, and of obstructions, are examined. Lighting at a point from which no sky is visible is generally inadequate. Standard sections of rooms showing effect of obstructions on limits of good and adequate lighting are shown. An appendix gives diagrams showing loss of sunlight due to obstructions. (Same item as 5J-183, Oct. 1954 MAB.) *Subject Heading:* 1. Daylight illumination.—C.E.P.B.

## 1932

7B-11

551.584.65(569.4)

\*Buxton, P. A., **Climate in caves and similar places in Palestine.** *Journal of Animal Ecology* 1:152-159, 1932. 2 tables, 11 refs. NNM—Paper records some observations made in Palestine

on temperature and humidity in caves and small cavities in rocks, during the height of the dry summer. Differences in saturation deficit observed between air in spaces in a wall of a cave and outside are sufficient to be of considerable biological importance. A small amount of observational data is included. (*Same item as 2E-100*, May 1951, *MAB.*) *Subject Headings:* 1. Cave microclimatology 2. Israel.—*H. P. Kramer.*

## 1933

7B-12

551.584.61

Egloff, K., Ueber das Klima im Zimmer und seine Beziehungen zum Aussenklima, mit besonderer Berücksichtigung von Feuchtigkeit, Staub- und Ionengehalt der Luft. [Climate inside a room and its relations to external climate with special reference to humidity, dust and ion content of the air.] 84 p. Thesis—Zürich. Eidgenössische Technische Hochschule, No. 766, [1933]. DWB. Review by K. Kähler in: *Naturwissenschaften*, 22(27):461-463, 1934. DLC—Using information gathered in 30,000 separate observations recorded during a year (1932-33) indoors at Davos, Switzerland, the author presents his conclusions on the following features of indoor climate: air temperature, relative humidity, rate of cooling, light intensity, dust count, number of condensation nuclei, and permanence of various ions. (*Same item as 3G-123*, July 1952, *MAB.*) *Subject Heading:* 1. Indoor climates 2. Davos, Switzerland.—*M.P. Kramer.*

7B-13

551.577.37:551.556.69

Thein, Wilhelm, Massgebliche Schlagregenwirkung in der Bautechnik. [Quantitative effects of driving rain in building technique.] *Annalen der Hydrographie und Maritimen Meteorologie*, 61:196-201, 1933. fig., 4 tables. DLC—An investigation of the penetration of driving rain through W.-S.W. walls of buildings in Hamburg in 1926-1930. Various formulas for the combined effect of wind and rain are examined and lower limits of damaging "Schlagregen" set out. (*Same item as 3G-132*, July 1952, *MAB.*) *Subject Headings:* 1. Rainfall influences 2. Wind effects 3. Building construction 4. Hamburg, Germany.—*C.E.P.B.*

## 1935

7B-14

551.521.1:69

Bacsó, Nándor, A napsugárzásból különböző fekvésű falakra jutó átlagos hőmennyiségek. [Mean heat amounts from solar radiation falling on differently facing walls.] *Időjárás*, Budapest, 11(9/10):165-171, Sept./Oct. 1935. 3 figs., 5 tables, ref. German summary p. 206-207. DLC—Using a method due to G. MARCZELL (1927), in which the intensity of solar radiation is a function of the sun's height, the amount of heat ( $\text{g cal/cm}^2$ ) falling on walls facing in 8 directions on a clear day in Budapest is calculated for each month. The percentage mean sunshine in each hour is tabulated for the middle day of each month and from this the actual direct solar radiation on each wall is calculated. Walls facing S. receive  $30,000 \text{ g cal/cm}^2/\text{year}$ , S.E. and S.W. walls nearly as much, N. walls only 400. E. walls have more morning and less evening sun than W. in winter; in summer this is reversed. *Subject Headings:* 1. Solar radiation calculations 2. Budapest, Hungary.—*C.E.P.B.*

7B-15

551.521.16:628.92

Great Britain. Department of Scientific and Industrial Research. Illumination Research, Seasonal variation of daylight illumination. Its Technical Paper, No. 17, 1935. 8 p. 7 figs., 3 tables, 2 refs. MH-BH—Measurements at Teddington with a portable photometer receiving light from one octant of sky, at 9, 12 and 15 h. in spring, summer, autumn and winter, are tabulated, with associated weather. Monthly averages of outdoor illumination from four octants and whole sky and of solar illumination at noon are shown by curves. (*Same item as 5J-185*, Oct. 1954, *MAB.*) *Subject Heading:* 1. Daylight illumination.—*C.E.P.B.*

## 1937

7B-16

551.584 551.586:628.8

Brezina, Ernst and Schmidt, Wilhelm, Das künstliche Klima in der Umgebung des Menschen. [Artificial climate surrounding man.] Stuttgart, Ferdinand Enke, 1937. 212 p. 22 figs., 28 tables, refs. DLC—This book, the combined effort of a physician and a meteorologist, is a comprehensive analysis and description of the various artificial climates under which men live, namely: the microclimate of clothing, of dwellings and of cities. The section on the measurement of climatic variables, on the heat economy of the body, on the microclimate of clothing and shoes, and on the thermal properties of fabrics is brief and much of it has become out of date. However, three-fourths of the book is devoted to the microclimates of dwellings and cities. Under the subject of dwelling microclimate the following topics are considered: the modification of the meteorological elements in the immediate vicinity of a building; the weather elements of light, heat and ions produced in the interior of a building; the thermal properties of building materials, namely, heat transmission, heat

storage, moisture absorption; the vertical distribution of temperature, cooling power and air movement in rooms; the climate of work rooms, of churches, etc; natural ventilation, air conditioning and heating of buildings. City microclimate is treated very thoroughly. The authors discuss the light and radiation conditions within a city; air pollution; the modification of temperature, precipitation and wind direction and velocity by groups of houses, by the direction of streets and by the general city plan; the diversity of climates within a city and various measures of improving urban climates. The comprehensive and systematic treatment of human microclimates makes this book a valuable introduction to the general subject of human microclimatology in spite of the fact that the book is old. (*Same as item 24-167, April 1951, MAB.*) *Subject Headings:* 1. Microclimatology 2. Urban climates 3. Heating and ventilating.—I.L.D.

7B-17

551.5:69

Hrudička, Bohuslav, *Meteorologie im Dienste der Bautechnik*. [Meteorology in the service of building technique.] *Zeitschrift für angewandte Meteorologie*, 54:37-47, 69-76, 1937; 55:110-119, 289-294, 1938; 56:248-255, 1939. DWB—A thorough summary, with numerous formulas and references, of all the various factors affecting buildings, including damage by wind and rain, penetration of wind-driven rain (Schlagregen) through walls, heating, thermal insulation, humidification, frost damage, length of building period, snow load, natural illumination, and acoustics (of street noises, as part of town climate). (*Same item as 3G-176, July 1952, MAB.*) *Subject Heading:* 1. Building construction.—C.E.P.B.

7B-18

551.588.7:69

Reisner, H., *Stadtklima und Bauwesen*. [Town climate and building methods.] *Zeitschrift für angewandte Meteorologie*, 54(10):309-316, Oct. 1937. DWB—The points discussed are: importance of cooling plant in tropical houses, possibility of decreasing thunderstorm frequency, favorable effect of afforestation and neighbourhood of large lakes. Settlements on swamps or wet ground are subject to thunder, fog and frosts and can be improved by draining. Author then turns to microclimatology of houses and work rooms, air conditioning and purifying, effect of towns on local climate and planning according to topographical weather conditions, and loss of light and heat through smoke, dust and fog, especially on the lee side of towns, where cloud and local heavy rain are also more frequent than to windward. *Subject Headings:* 1. Building construction 2. Urban influences.—C.E.P.B.

1939

7B-19

551.586:628.8

Linke, F., *Zur Physik des künstlichen Klimas*. [On the physics of artificial climates.] *Bal-neologe*, Berlin, 6(6):241-249, 1939. 3 figs. DSG—Describes the American concept of "effective temperature" of a room, as the temperature which would give the same feeling of comfort at relative humidity 100% as that given by the actual temperature and R.H. in still air. The comfort optimum however varies with time, race and subject. Methods of maintaining required temperature and humidity are mentioned. Other factors are wind strength and temperature range, both greater in the open than in rooms, aerosol and atmospheric composition. A series of counts of nuclei and small ions in artificial climates of rooms is described. Arguments for and against air conditioning are summarized; author thinks that in central Europe wholesale conditioning of homes and offices would be harmful. *Subject Headings:* 1. Air conditioning 2. Comfort climate.—C.E.P.B.

7B-20

551.588.7

Schou, Georg, *Fuktighetsundersokelser i husrum*. [Humidity investigations in dwelling houses.] *Norske Elektrisitetsverkers Forenings, Publikasjoner*, No. 129, 1939. 40 p. 19 figs., tables. German summary, p. 36-40. GB-MO—Observations of temperature and humidity were recorded by thermohygrograph in rooms in buildings of different types in winter with various methods of heating. The differences were not due to nature of heating but to "local" conditions—number of occupants, size, ventilation, floor covering, etc. There is a linear relation between room temperature and absolute humidity. (*Same item as 3G-179, July 1952, MAB.*) *Subject Headings:* 1. Indoor climates 2. Humidity in buildings.—C.E.P.B.

1940

7B-21

551.586:628.8

†Amelung, W., *Künstliches Klima*. [Artificial climates.] (In *Lehrbuch der Bäder- und Klimaheilkunde*, Heinrich Wilhelm Vogt, ed. Berlin, Springer, 1940. p. 950-966. figs., refs.) DLC—Artificial climates are defined as climates in which temperature, humidity and other climatic factors are altered by man. After a brief discussion of clothing and city climates, the author discusses the characteristics of artificial climates of enclosed spaces created for hygienic and therapeutic purposes. The measurement of comfort by the methods of LINKE and of BRADKE and LIESE are

described. The author considers the principles and problems of air conditioning work rooms and therapeutic rooms for the treatment of allergy, respiratory diseases, etc; the special characteristics of artificial as compared with natural climates; the therapeutic value of wind movement, aerosol and ionic properties of air conditioned rooms; the importance of artificial sunlight and the general problem of climatic therapy by means of air conditioning. An extensive bibliography is appended. (Same item as 2.3-164, March 1951, MAB.) *Subject Heading: 1. Artificial climates.—I.L.D.*

7B-22

697.9

Warner, C. G., *Measurements of the ventilation of dwellings.* *Journal of Hygiene*, 40(2):125-153, March 1940. 4 figs., 17 tables, 22 refs. **DLC**—The methods of estimating rate of air change by gas dilution are summarized and measurements with a 'katharometer' described. Experiments were made in 31 rooms of different construction and the effect of various factors discussed, including external wind speed (most important) and temperature difference between outside and inside. A minimum change of 600 cu ft per person per hour should suffice but in closed flueless rooms the change is much below this. *Subject Heading: 1. Ventilation of houses.—C.E.P.B.*

1941

7B-23

551.588.7:551.524

Iyer, V. Doraiswamy, *Air temperatures given in meteorological reports compared with those on the first floor of a building at Poona.* *Current Science*, Bangalore, 10:329-330, 1941. **DLC**—A year's comparison of maximum and minimum temperatures in the screen in the open with a thermograph on a first floor landing. Mean daily maxima were 7.7°F higher and minima 9.9° lower, in screen than in building, differences greatest in winter and spring. (Same item as 3G-184, July 1952, MAB.) *Subject Headings: 1. Indoor climates 2. Poona, India.—C.E.P.B.*

7B-24

551.510.41:631.2

Zorn, W. and Freidt-Kraftborn, G., *Registrierende Bestimmungen der Luftzusammensetzung im Rinderstall.* [Recording the composition of the air in stables.] *Forschungsdienst*, Berlin, 11(3/4):402-426, 1941. 9 figs., 3 tables, 33 refs. **DA**—The content of carbon dioxide in the air of a stable housing 75 cows was measured. The values obtained were 0.09-0.24 g/l; it varied in direct proportion with absolute humidity and had no relation to relative humidity and temperature variations. (Same item as 3B-220, Feb. 1952, MAB.) *Subject Headings: 1. Carbon dioxide in barns 2. Barn climates 3. Indoor air.—N. A. Zikeev.*

1942

7B-25

551.584.61:551.586:612

Hülser, Hans, *Über Temperatur und Feuchtigkeit in Innenräumen.* [On temperature and humidity in rooms.] *Zeitschrift für angewandte Meteorologie*, 59(1):12-25, Jan. 1942. fig. **DLC**—Feeling of comfort reported by normally clothed subjects in Germany was plotted against temperature and relative humidity in rooms. Curves are shown for sedentary healthy males and for sick and tired subjects (and women), also for upper limit of comfort and for comfort of active subjects. The physical and medical aspects are discussed, also the maintenance of favorable conditions of temperature and humidity in occupied rooms, ventilation and purity of the air. *Subject Headings: 1. Indoor climates 2. Cooling power 3. Comfort climate.—C.E.P.B.*

7B-26

551.501.42:551.571

Institution of Heating and Ventilating Engineers, London, *Tables of hygrometric data for air conditioning calculations as embodied in the Guide to Current Practice issued to its members.* London, Whitefriars Press, 1942. 70 p. tables, nomogram. **GB-MO**—Following a list of symbols, data and formulas, tables give for temperatures of 30 to 136°F, R.H. 100 to 0, vapor pressure in mb, dew point °F, moisture in grains, total heat B.t.u., volume in cu ft per lb or dry air and wet bulb °F in screen and sling. (Same item as 2D-71, April 1951, MAB.) *Subject Headings: 1. Air conditioning 2. Hygrometry.—C.E.P.B.*

7B-27

551.582:69

Wegener, Kurt, *Haus und Klima.* [House and climate.] *Zeitschrift für angewandte Meteorologie*, 59(1):1-6, Jan. 1942. **DLC**—Lists some local peculiarities of houses which are related to local climatic factors, such as steep and anchored roofs in windy places, verandas to east and west in Brazil. Thick walls and stone floors in Montevideo are cool but cause great condensation when warm moist air follows a cold spell. Movable glass roofs are an advantage. In Samoa solid wooden houses with interior walls covered with washed pebbles give protection from wind, rain and earthquakes. In Spitsbergen and Norway wooden houses are lined with roofing felt and millboard with spaces filled with moss; air circulation is reduced. German peasant houses are built round a court,

and are windowless on the weather side. Further south the streets have broad arcades to protect foot traffic against heavy rain and snow. *Subject Headings: 1. Building construction 2. Local climates.*—C.E.P.B.

1943

7B-28

551.586:613.4:672

Schiefer, H. F., *Advantages of a blanket-and-sheet combination for outdoor use.* U. S. National Bureau of Standards, *Journal of Research*, 30(3):209-214, March 1943. table. **DLC**—Various blankets were tested alone and in combination with one and with two sheets for air permeability and thermal transmission. The effect of laundering on these and other physical properties are reported. Results show the advantage of a sheet in combination with a blanket over a blanket for protection against wind and rain or snow. *Subject Headings: 1. Bed climates 2. Camping microclimatology.*—C.E.P.B.

1944

7B-29

551.558:656.25(661)

Brun, A., *Les locomotives transsahariennes et l'érosion sableuse.* [Trans-Saharan locomotives and sand erosion.] *Académie des Sciences, Paris, Comptes-Rendus*, 218:419-421, March 6, 1944. **DLC**—The plan to use Diesel locomotives for trans-Sahara railway showed that protection of external parts against sand and filtering of the air supply for engine and carriages were essential. The composition and sizes of the sand grains were investigated. *Subject Headings: 1. Sandstorms 2. Microclimate of railroad equipment 3. Sahara.*—C.E.P.B.

7B-30

678.81 697

Mackey, Charles Osborn; Wright, L. T., Jr.; Clark, R. E. and Gay, N. R., *Radiant heating and cooling.* Cornell Univ. Engineering Experiment Station, *Bulletin*, No. 32, Aug. 1943; No. 33, Aug. 1944. figs., tables, refs. **Part 1**, Angle factors for calculations on radiant heating and cooling; **Part 2**, (by C. O. Mackey), Thermal environment and radiant heating. **DWB**—Contains data, nomograms, etc. with theory, geometry and discussion. *Subject Heading: 1. Heating and cooling.*—M.R.

7B-31

551.5:6(02)

\*Schaerer, Fredy Fritz, *Klimatechnik, Leitfaden für Entwurf, Berechnung, Beschreibung und Ausführung von Klimaanlage.* [Air conditioning engineering. Principles of design, calculation, description and construction of air conditioning installations.] 2d ed. Zurich, Rascher Verlag, 1944. 228 p. 121 figs., 5 plates, 21 tables, 20 refs. **DLC**—This book deals with air conditioning for health and industrial purposes. The first section deals with the elements of climate, including solar radiation on surfaces facing in different directions, external and internal temperature and humidity (diurnal and annual variations) and wind velocity, all for places in Germany. Pt. 2 takes up the hygienic basis of air conditioning, human heat and moisture economy, scales and instrumental measurements of comfort, effective temperature, and effect of clothing. Pt. 3 sets out the physics of air conditioning, including interaction of heat and humidity and the energy involved in heating or cooling the air, with examples. Pt. 4 describes the optimum temperature and humidity for different purposes (industrial operations, hospitals). The lay-out and construction of different systems of conditioning installations, including air filters and washers, is given. This is continued in greater detail in Pt. 5, with numerous working diagrams and photographs, and a planning schedule. In Pt. 6 the instrumental equipment necessary for checking the actual room temperature, humidity, and air movement is illustrated, including a control panel, and Pt. 7 describes the regulators for maintaining the desired conditions. Finally, Pt. 8 goes into particulars of air supply ducts required, circulation in rooms, and keeping down noise to the limits necessary for different occupations. The book is very well illustrated and includes numerous diagrams and working tables. *Subject Headings: 1. Industrial meteorology 2. Bioclimatology.*—C.E.P.B.

7B-32

551.521.16:628.92

Smith, T. and Brown, E. D., *The natural lighting of houses and flats with graded daylight factor tables.* Teddington, England. National Physical Laboratory, Dept. of Scientific and Industrial Research, April-Sept. 1944. 21 p. 2 figs., tables. **GB-MO**—Recommendations of width and height of windows to give adequate lighting on a surface 2 ft 9 in. above floor. Most of the work consists of "graded daylight-factor" tables for unbarred windows without and with exterior obstructions, heights  $2\frac{1}{2}$ -6 ft, widths 3-8 ft, showing for kitchen (2%), living room (1%) and bedrooms ( $\frac{1}{2}$ %), external daylight, depth of penetration and half-breadth of daylight area in feet and daylight area in sq ft. Allowance of 20% is made for light lost in passing through window, and corrections are suggested for barred windows. *Subject Heading: 1. Daylight illumination.*—C.E.P.B.

## 1945

7B-33

551.524.37:697(410)

Grierson, Ronald, **Meteorological history and the space-heating machine.** *Institution of Mechanical Engineers, London Proceedings*, 153:381-408, 1945. 23 figs., 21 tables, 19 refs. **DLC**—A discussion of efficiency factors in heating rooms and loads for various purposes is followed by temperature tables (minima, hourly and weekly), normal weekly degree-days to 60°F for each week and month for 11 districts. Weather cycles and long period variations of temperature at Kew and Greenwich are considered during period 1845-1945 and abnormally cold winters and cold spells in Britain tabulated from heating point of view, with daily charts of British Isles for frost of Feb. 1895. *Subject Headings*: 1. Severe winters 2. Heating degree days 3. Great Britain.—C.E.P.B.

7B-34

551.584.65

\*Sutton, L. J., **Meteorological conditions in caves and ancient tombs in Egypt.** *Egypt. Physical Dept., Paper No. 50, 1945.* 81 p. 20 figs., 17 tables, refs. **NN**—Analysis made of meteorological conditions in one of the caves in the Muquattam hills at Tura, near Cairo. Observations of temperature, moisture content, relative humidity and evaporation were made. Temperature and humidity conditions in several ancient Egyptian tombs are also noted. (Same item as 2J-223, Oct. 1951, M.A.B.) *Subject Headings*: 1. Cave climates 2. Tombs 3. Egypt.—H. P. Kramer.

## 1946

7B-35

551.521.16:628.92

Dufton, A. F., **Protractors for the computation of daylight factors.** *Great Britain. Dept. of Scientific and Industrial Research. Building Research, Technical Paper, No. 28, 1946.* 16 p. 11 figs. **DLC**—The construction and use of protractors for finding the ratio of the illumination on the working plane at a point in a building to that out of doors from the whole sky are described. The estimation of the effect of sloping glazing is included. *Subject Heading*: 1. Daylight illumination.—C.E.P.B.

7B-36

551.586:628.8

†Great Britain. Ministry of Fuel and Power and Gr. Brit. Department of Scientific and Industrial Research, **Domestic heating in America: a study of heating, cooking and hot water supply in small houses in U.S.A. and Canada.** London, H.M.S.O., 1946. 152 p. 16 figs., 23 tables, bibliography p. 126-148. **GB-MO**—This study in countries with severe winters and a high standard of comfort shows that full house heating has been achieved with comparatively low fuel consumption. Houses are more open internally, permitting a lower standard of ventilation. Heating is mainly by warm air, hot water radiators or low temperature radiation, but other types are being tried. High temperature radiation such as open fires is rare. Thermostatic control is frequent. Other points dealt with include smoke abatement, hot water supply, solar water heaters, heat insulation, use of tiled chimneys and briquette fuel. *Subject Heading*: 1. Heating of houses.—C.E.P.B.

7B-37

551.521.1:697

Hand, Irving F., **Solar energy received on a vertical surface facing south.** *American Meteorological Society, Bulletin*, 27(7):416, Sept. 1946. table. **DWB**—Table gives measurements with a pyrheliometer on a vertical surface facing south, Sept. 1945-March 1946, as average daily B.t.u.s per sq ft and ratio to horizontal amount, for cloudiness 0-3, 4-7 and 8-10, and monthly totals per sq ft. The advantages of windows facing south are summarized. *Subject Heading*: 1. Solar heating.—C.E.P.B.

7B-38

551.521.1:697.1

Hottinger, M., **Einfluss der Sonnenstrahlung auf die Oberflächentemperatur und die Wärme-einströmung durch Aussenwände, Dächer, Fenster und Oberlichter.** [Influence of solar radiation on surface temperature and the passage of heat through outer walls, roofs, windows and skylights.] *Schweizerische Bauzeitung*, 128(17):213-217, Oct. 26, 1946. 9 figs., 2 tables, 5 eqs. **DLC**—The possible duration of sunshine in hours, and solar radiation in Kcal/in<sup>2</sup>, on S., W., E. and N. walls and a flat roof in Zurich are set out in curves. Diurnal variation of radiation on walls and 30° slopes is shown for 50°N. Graphs are given for determining surface temperature from radiation received, absorption factor and outside air temperature, with correction factors for inside temperature and conductivity of walls. Absorption factors, black surface 0.9, grey and colored 0.7, white 0.5. The practical calculation of incoming heat is shown with examples, including effect of windows and skylights. Losses due to shadows, dirt on glass, etc., gain by using special glass and effect of ventilation are described. *Subject Headings*: 1. Solar radiation effects 2. Solar heating 3. Zurich, Switzerland.—C.E.P.B.

7B-39

551.58:69

Sarle, Chas. F., **Applications of climatology to building construction and agriculture.** *American Meteorological Society, Bulletin*, 27(5):210-215, May 1946. DWB—War requirements have made climatology more specialized, e.g. by use of frequencies of single or combined elements, derived by machine methods. Similar data are required for house design, e.g. frequency of combination of low temperatures and high winds. A Weather Bureau plan for providing essential information for critical weather elements and for bringing it into use, initially for 100 selected stations, is described. Agricultural applications are also outlined. *Subject Headings: 1. Applied climatology 2. Building construction.*—C.E.P.B.

1947

7B-40

551.586:697

[Avery, Lester T.], **Suggests we abandon "comfort" and air condition for health.** *Heating Piping and Air Conditioning*, 19(12):106-107, Dec. 1947. fig. DWB—Discusses the subject of the proper temperatures and humidities for winter and summer air conditioning. Comfort lines meaningless, considering effect of panel cooling of cold surfaces, warmth from ceiling heated by strong lights, sunshine or convectively raised hot air. ASHVE Comfort Chart for still air in error if "healthful" conditions are to be considered. Recent data secured by Army and Navy should be used even if it contradicts older ideas. (*Same item as 3-134, March 1950, MAB.*) *Subject Headings: 1. Applied climatology 2. Air conditioning.*—M.R.

7B-41

551.5:697(43)

Deutscher Normenausschuss, **Regeln für die Berechnung des Wärmebedarfes von Gebäuden.** [Rules for calculating heating needs of buildings.] Its DIN 4701, July 1947. 36 p. 4 figs., tables, 6 refs. Also: **Klimaeinwirkungen Prüfung.** [Climatic effects testing.] *Ibid.*, 1949, June 1948. 6 p. GB-MO—The first paper sets out in detail the basis of the calculations of heat requirements of rooms in different positions with walls of different heat conduction and at different outside temperatures. Tables and detailed examples of calculation are given for normal buildings. Pt. 2 gives basic climatic data for central Europe, including lowest outside temperature to be expected, desirable temperatures for different rooms, temperature of unheated rooms in different positions, effect of wind, loss of heat through windows, doors, walls and roofs of a great variety of materials and of different construction, and floors. Heat conductivities of numerous materials are tabulated. An appendix discusses special cases—unusually solid and flimsy buildings, long interruption of heating, exposed positions, extra large and high rooms. The second paper gives some climatic standards for test chambers for various purposes. *Subject Headings: 1. Building standards 2. Climatic effects 3. Germany.*—C.E.P.B.

7B-42

551.574:699.82

Dill, R. S., **Condensation in buildings.** *Heating and Ventilating*, New York, 44:70-74, 1947. fig., 2 tables. DLC—Sources and spread of moisture in buildings and causes of condensation on walls and windows, roofs, attic spaces and floors are discussed. Unfloored "crawl spaces" under buildings are important sources of vapor in fall. Methods of prevention by ventilation and vapor barriers are examined, vapor barriers may save more than half the loss of heat by ventilation in cold weather. *Subject Heading: 1. Condensation in buildings.*—C.E.P.B.

7B-43

551.58:728

Drysdale, J. W., **Climate and house design; summary of investigation 1945-1947.** *Australia. Commonwealth Experimental Building Station, Duplicated Document*, No. 21, June 1947. 33 p. photos, diagr. DWB—Test huts differing in materials of wall construction and in ceiling insulation and erected with the same orientation in towns in eastern Australia representative of various climatic zones were used to determine comfort conditions indoors under different climatic conditions. The construction and design of the huts are described and illustrated with diagrams and photographs and the dry bulb temperature inside the huts during winter and summer are discussed. (*Same item as 3G-202, July 1952, MAB.*) *Subject Headings: 1. Building design 2. Australia.*—I.L.D.

7B-44

551.578.46:551.556.1:69

†Esquillan, M., **Les nouvelles règles françaises relatives à l'action de la neige et du vent sur les constructions.** [The new French rules on action of snow and wind on buildings.] *Institut Technique du Batiment et des Travaux Publics, Circulaire*, 1(38), Nov. 8, 1947. 23 p. 22 figs., 46 refs., eqs. GB-MO—Author points out absurdity of earlier rules which required all buildings (even bicycle sheds) to be constructed for a pressure of 120 or even 200 kg/m<sup>2</sup> in Paris. He sets out the bases of the new French rules. He first considers snow loads at different heights in France. He then discusses relations between wind velocity, shape and orientation of obstacles, and dynamic

wind pressure, including effect of gustiness and variation with height. Effect of an obstacle on wind structure and resulting wind pressure or suction on walls at various angles to wind are examined in relation to regulations in different countries, and expressed in a series of graphic diagrams. Effect of wind on various other structures is discussed. *Subject Headings:* 1. Snow loads 2. Wind pressure

3. Building resistance 4. France.—C.E.P.B.

7B-45

551.521.1:697.7

\*Hand, Irving F., *Solar energy for house heating: an application of solar data to heating through windows facing south.* *Heating and Ventilating*, New York, 44(12):80-94, Dec. 1947. 7 figs., 16 tables. DLC—This paper gives data for calculating solar and sky radiation received on horizontal surfaces and surfaces facing south and east, between latitudes 30° and 50°N. Tables and curves show solar altitude and azimuth, effect of cloud and sky radiation; an example of calculation of solar energy received on a south wall and window and weekly means for each hour at Blue Hill are given. *Subject Headings:* 1. Solar radiation 2. Solar houses.—C.E.P.B.

7B-46

551.586

Handisyde, Cecil C., *The climate of the home.* *Weather*, 2:82-87, 1947. fig. 2 plates, table. DWB—Mainly based on *Domestic heating in America* (H.M. Stationery Off., 1946; see 7B-36 above). Methods of heating and ventilating are related to sunshine and temperature in U. S. and British cities. (Same item as 3G-203, July 1952, MAB.) *Subject Heading:* 1. Heating and ventilating.—C.E.P.B.

7B-47

551.524.3:551.584

Landsberg, H. E., *Use of climatological data in heating and cooling design.* *Heating, Piping and Air Conditioning*, 19:121-125, Sept. 1947. 8 figs., table. DLC—Basic data for best balance between initial cost and upkeep are frequency distributions of hourly observations. Temperatures for heating and cooling plant are represented as probability curves of heating and cooling degree days at Washington, 1898/9-1945/6, shown as straight lines on logarithmic probability paper. Such data only apply to the place of observation; local differences are illustrated by isolines of frequency of differences of maximum and minimum temperature between Washington and suburban station of Sleepy Hollow, and regression lines of seasonal degree day values, Washington-Cheltenham, Md. (showing effect of a change of site). Effect of air motion and incident radiation are briefly considered. *Subject Headings:* 1. Temperature variations 2. Heating and cooling 3. Building design.—C.E.P.B.

7B-48

551.556.1:699.83

Sherlock, R. H., *Gust factors for the design of buildings.* *International Association for Bridge and Structural Engineering, Publications [Memoires]*, 8:207-236, 1947. 25 figs., 16 refs. English, German and French summaries p. 234-235. DLC—Causes of gustiness are described. Frequency diagrams and statistical representation ( $\frac{1}{2}$  second gusts, 5-min average velocities and most probable maximum gust) are shown and gust factors (gust velocity/mean velocity) deduced for different storms. To allow for width of buildings 10-sec velocities are considered. Variations of wind velocity and gust factors up to 200 ft are shown. A map of United States is given showing recommended wind velocity pressures in lb/ft<sup>2</sup> for use in design of low buildings. *Subject Headings:* 1. Wind pressure 2. Building design.—C.E.P.B.

7B-49

551.521.6:697

Tasker, Cyril, *How infra-red radiation is used for space heating.* *Heating, Piping and Air Conditioning*, 19(10):104-106, Oct., 1947. p. 104-106. DWB, DLC—A review of two papers presented before the British Institution of Heating and Ventilating Engineers, entitled *Specific Effects of Infra-Red*, and *Infra-Red in Relation to Space Heating* (Vol. 13, No. 129, and Vol. 14, No. 138 from *Journal of Institution of Heating and Ventilating Engineers*). Contains material of interest for those concerned with radiant heating for industrial purposes and for human comfort. Comprehensive bibliography and description of advances in application of "infra-red." Review contains charts showing (1) transmission of radiation through water and the human skin, (2) relation of emissive power to temperature for black body, water vapor and CO<sub>2</sub>, (3) black body radiation energy distribution at different radiant temperatures, (4) radiant temperature in relation to distance from black body radiator, (5) diagram of overhead radiant heater showing operation. Optimum condition for comfort probably lies around an air temperature of 55°F and a density of radiant flux around 75 B.t.u./sq ft/hr. Possibilities and difficulties in developing equipment for industrial use. Reflectors, beams, gas radiants, reflective paints, convection currents set up with variable output. (Same item as 1-77, Jan. 1950, MAB.) *Subject Headings:* 1. Radiant heating 2. Industrial meteorology.

1948

7B-50

551.586:628.8

Bedford, Thomas, **Human factors in industry: heating and ventilation.** *Advancement of Science* London, 5:103-107, 1948/49. **DLC**—Paper discusses purposes of ventilation (removal of body odors and prevention of spread of air-borne infections), standards of warmth (in winter about 65°F and not below 60°F, with adjustments for radiant heat from apparatus or to walls). Effect of temperature and humidity on efficiency is examined, including textiles, mental work, liability to accidents, and sickness. Some recommendations are made. *Subject Headings:* 1. Heating and ventilating 2. Physiological climatology.—*C.E.P.B.*

7B-51

551.586:612:69

Drysdale, J. W., **Climate and house design: physiological considerations.** *Australia, Commonwealth Experimental Building Station, Duplicated Document*, No. 25, 1948. Also his: **Climate and design of buildings: physiological study No. 2, A short study made during 1950 of the effects of summer conditions on human buildings.** *Ibid.*, *Technical study*, No. 32, 1950. Also his: **Physiological study No. 3. A further examination of discomfort conditions and of the influence of radiation from above.** *Ibid.*, *Technical study*, No. 35, 1951. 15+21+15 p. figs., tables. **DLC**, **DWB**—Experience suggested that effective temperature is not a reliable guide to comfort at high temperatures. The onset of discomfort is related to the thermal zone in which ability of the body to lose heat approaches the heating effect of the environment. General body perspiration (measured electrically) was found to be associated with serious discomfort. Experiments in Australia in summers of 1948, 1950 and 1951 are summed up for sedentary workers as: mean environmental conditions producing discomfort.

| Vapor pressure mm              | 13 |       |     | 22 |    |     |
|--------------------------------|----|-------|-----|----|----|-----|
| Air movement f.p.m.            | 10 | 75    | 200 | 10 | 75 | 200 |
| Dry bulb causing discomfort °F | 88 | 88/89 | 95  | 86 | 88 | 94  |

For manual workers temperatures were about 4°F higher. Effect of radiation was tested by an overhead plate heated to 120°F. It was found to be psychological rather than physiological. For building design upper limit aimed at should be 84-85°F at moderate humidity and low air movements but 86°F when humidity is low and air movement considerable. (For Study No. 2, see 3G-224, July 1952, *MAB.*) *Subject Headings:* 1. Comfort zones 2. Australia.—*C.E.P.B.*

7B-52

551.524.36:697 (436)

Lauscher, Friedrich, **Klimatische Grundlagen für die Berechnung des Mindestwärmeschutzes von Wohnbauten.** [Climatic basis for calculating minimum heat requirements for dwelling houses.] *Wetter und Leben*, 1(9):257-260, Dec. 1948. fig., table. **DLC**—The best measure of the need for heat conservation of a building is the mean annual minimum (MAM) temperature. The figures given in DIN rules 4701 for Austria for the 5 coldest days of the severe month Feb. 1929 agree with the MAM (1881-1930) north of the Alps but are about 5°C too high for south Alpine lands and 11°C too high on Sonnblick. In valleys the MAM are much lower than those given by the normal curve of variation with height for free exposure. Below 1500 m he distinguishes four groups of stations by their MAM: relatively warm, normal, relatively cold and very cold. *Subject Headings:* 1. Temperature extremes 2. Building construction 3. Austria.—*C.E.P.B.*

7B-53

551.521.1:692

Parodi, Hippolyte, **Note sur l'échauffement produit par le rayonnement solaire dans des enceintes closes par des parois absorbantes.** [Note on the heating produced by solar radiation in spaces enclosed by absorbent walls.] *Académie des Sciences, Paris, Comptes Rendus*, 226(26):2128-2129, June 28, 1948. fig., table. **DLC**—An attempt to adjust degree-day calculations by taking into account the daily global radiation on a horizontal surface. (Same item as 1-71, Jan 1950, *MAB.*) *Subject Headings:* 1. Solar radiation 2. Heating and ventilating.

7B-54

551.584.6:625.1

Sissenwine, Norman, **Temperature and humidity cycle: hot weather storage.** *U. S. Quartermaster Corps. Research and Development Branch. Environmental Protection Section, Memorandum Report*, No. 21, March 10, 1948. 3 p. 5 figs. **DWB**—For use in design and testing of materials for preservation under varying storage and shipping conditions, five typical high temperature storage conditions are defined and studied. These are: a) Temperate Summer Warehouse (Cameron, Va.) b) Moderate Desert (Yuma, Ariz.), c) Extreme Desert (Camp Lee, Va.), d) Moist Tropical Beach head (Indian Bay, Fla.), and e) Moist Tropical Warehouse (Panama Canal Zone). Each study

covered a 24-hr day. The Extreme desert cycle shows an hour at a temperature of 160 and relative humidity of 5%, even though not in a typical desert environment. *Subject Headings: 1. Storage climates 2. Extreme high temperature of equipment.—M.R.*

7B-55

551.501.45:551.521:697

Stewart, James P., *Solar heat gain through walls and roofs for cooling load calculations. Heating, Piping and Air Conditioning*, 20(8):121-132, Aug. 1948. 3 figs., 6 tables, eqs. DLC—A simplified method is presented for determining heat gain through walls and roofs due to combined effect of solar radiation and air temperature difference. This is accomplished by tables of equivalent temperature differentials, in which all types of building construction are grouped under a few classifications. (Same item as 1-69, Jan. 1950, MAB.) *Subject Heading: 1. Solar heating.—Author's abstract.*

7B-56

551.5:697 (02)

\*Strock, Clifford, *Heating and ventilating engineering databook*. New York, Industrial Press, 1948. 576 p. 193 figs., 317 tables. DLC—An elaborate compilation of useful data, tables, nomograms, charts, definitions, equations, formulas, and instructions for calculating the effects of sun, temperature, humidity and wind on heat loss or gain within buildings. Extensive psychometric tables and charts; temperature, degree-day and water temperature data and charts for scores of places in the United States; analytical solar radiation data for various latitudes or solar angles are among the data of interest to applied climatologist or meteorologist. Specifications for water vapor, properties of air, thermometry, psychometry, conduction, convection, radiation, the heat pump, snow melting, degree-days, insolation and comfort are amply provided. (Same item as 5-13, May 1950, MAB.) *Subject Headings: 1. Computation tables 2. Physical constants 3. Heating and ventilating 4. Handbooks.—M.R.*

7B-57

551.586:697 (02)

Turpin, F. Burlace, *Heating and air conditioning equipment for buildings, with a foreword by A. Leonard Roberts*. London, Pitman, 1948. 286 p. 107 figs., 11 charts. DLC—This book deals first briefly with the atmospheric conditions (temperature, humidity, cleanliness) for comfort and industry, and the general methods of heating, ventilating and air conditioning. The greater part of the book is taken up with descriptions of the various systems and appliances, fuels, installation and performance. Appendices give a number of useful tables and charts. *Subject Headings: 1. Heating 2. Air conditioning.—C.E.P.B.*

7B-58

551.524.36:697.9

Woolrich, W. R. and Rice, W. M., *Solar radiation absorption by wetted roofs. Heating and Ventilating*, New York, 45:84-87, Jan. 1948. 6 figs. DLC—Formulas for evaporation from shallow pools are discussed. A graph is given of hourly temperatures on dry roofs of different materials and sprayed tar felt, compared with dry and wet bulb. Red slate tar felt reached 165°F, dry bulb 100°, sprayed roof 95° and wet bulb 75°. The maximum temperatures in shallow (1-6 in.) tanks were 5-10°F below air, increasing with depth. *Subject Heading: 1. Cooling of houses.—C.E.P.B.*

## 1949

7B-59

551.58:72:016

†American Institute of Architects, *Regional climate analyses and design data. Part I. The mid-Ohio region. II. Metropolitan New York and New Jersey. III. South Florida—Miami. IV. Arid southwest area. V. Mid-Mississippi Basin. VI. Gulf coast. VII. Chicago area. VIII. Twin City area. IX. Washington, D. C. area. X. Boston area. XI. Pittsburgh, Penna. XII. Portland, Oregon. XIII. Charleston, S. C. XIV. Albany, N. Y. XV. Denver, Colorado. Collection of reprints from: American Institute of Architects, Bulletin, 1949, 1950, 1951 and 1952. figs., maps, 135 refs. DWB—An elaborate plan for making available and interpreting climatic data, collected by the U. S. Weather Bureau, for the benefit of architects and air conditioning designers was worked out by the editors of *House Beautiful* with the help of PAUL SIPLE and other applied climatologists. Several of the regional charts, tables and graphs are included in this collection. Climagrams and other fancy presentations for temperature, dew point, sunshine, wind, solar heat, cloudiness, snowfall, precipitation, rainy days, fog, relative humidity, thunderstorms and other factors are shown for several areas. A glossary of climatic terms, a verbal analysis of each of the factors, and a list of 135 references add to the value of the work. A number of interpretations of the climatic data in terms of building design or clothing requirements à la SIPLE are also included. (Same item as 3G-245, July 1952, MAB.) *Subject Headings: 1. Architectural climatology 2. Graphical presentation 3. Building design 4. Bibliographies 5. United States.—M.R.**

7B-60

Aujeszký, László, A közvetett sugárzás jelentősége a szobaklímában. [The significance of indirect radiation for indoor climate.] *Időjárás*, 53(11/12):377-381, Nov./Dec. 1949. 2 refs. English summary p. 407. **MH-BH**—A long textual article giving information on various kinds of solar radiation and their effects on comfort and air conditioning of buildings. (Same item as 2.7-97 July 1951, *MAB*.) **Subject Headings:** 1. Radiation 2. Heating and ventilating.—*M.R.*

551.521:697

7B-61

Berg, Hellmut, Die Schwächung der direkten Sonnenstrahlung durch Reflexion beim Durchgang durch eine Glasscheibe. [Attenuation of direct solar radiation by reflection during passage through a glass sheet.] *Wetter und Klima*, 2(1-2):23-32, Jan.-Feb. 1949. 2 figs., 2 tables, 2 eqs. **DWB**—Relation between reflected and transmitted radiation through glass windows or roofs depends on angle of incidence of rays. With small absorption and high angle of incidence, it also depends on polarization of light in relation to plane of glass. Table 1 gives hourly values for lat. 50° of radiation through glass for south, north, east, and west aspects; inclination of plate 0-90° for summer and winter solstices and equinoxes. Table 2 gives daily sums. (Same item as 3-65, March 1950, *MAB*.) **Subject Headings:** 1. Solar radiation 2. Building design 3. Solar houses.—*C.E.P.B.*

551.521.31:697

7B-62

Drotschmann, H., Das heiztechnische Klima der Schweiz im Winter 1948/49. [The heating technology climate of Switzerland in winter 1948/49.] *Schweizerische Blätter für Heizung und Lüftung*, 16(3):77-89, 1949. 13 tables. Also: . . . 1950/51. *Ibid.*, 18(3):57-69, 1951. **NN**—These reports, in continuation of similar reports for preceding years, give a summary of means and frequencies of air temperature for selected stations, precipitation, wind strength, "heating days" and heating degree days, cost of various fuels and estimated cost of heating each winter from 1933/34 to 1948/49 as a ratio to that for 1935/36. A summary of the whole series of reports is given in Drotschmann, H., *Technische Klima-Daten für die Schweiz*. [Technical climatic data for Switzerland.] *Ibid.*, 20(4):105-122, 1953. **Subject Headings:** 1. Local climates 2. Switzerland.—*C.E.P.B.*

551.582:697(494)

7B-63

Goethe, S. P., What will be the relative humidity? A method of predicting summer air conditioning performance at fractional loads. *Florida. University. College of Engineering. Technical Paper Series*, No. 26, 3(4), June 1949. 6 p. 11 figs., table, 3 refs., 8 eqs. Reprinted from *Refrigerating Engineering*, N. Y., Feb. 1949. **DWB**—The heat balance is set out for the air in a theater at Gainesville, Fla. with a thermostatic air conditioning system. The psychrometric cycle is set out diagrammatically and the condensing unit capacity determined as a function of refrigerant evaporating temperature and entering wet-bulb. The method of calculating dry bulb temperature and relative humidity under given conditions is shown by an example. A number of practical conclusions are drawn from the calculations. (Same item as 3.3-169, March 1952, *MAB*.) **Subject Headings:** 1. Humidity effects 2. Air conditioning.—*M.R.*

551.571:628.3

7B-64

Kaempfert, Wolfgang, Zur Frage der Besonnung enger Strassen. [On the insolation of narrow streets.] *Meteorologische Rundschau*, 2(7/8):222-227, July/Aug. 1949. 6 figs., 10 tables, 5 refs., 4 eqs. **DWB**—Narrowness *E* is defined as height of houses/width of street. For use of architectural diagrams are given for 50°N showing the track of the sun on 20 equally spaced days, in elevation and plan, insolation on streets of different "*E*" running in different directions, and on walls facing S.E. and N.W. Examples for three actual streets are examined, including windows at different levels. **Subject Headings:** 1. Insolation 2. Town planning.—*C.E.P.B.*

551.521.11:711.3

7B-65

Nicolet, M.; Bossy, L. and Dogniaux, R., Ensoleillement et orientation en Belgique, Pt. I. [Insolation and orientation in Belgium, Pt. I.] *Belgium. Institut Royal Météorologique, Mémoires*, Vol. 32, 1949. 41 p. 5 figs., 11 tables, 9 eqs. Nicolet, M. and Bossy, L., Pt. 2. *Étude pratique des surfaces verticales orientées*. [Practical study of vertical oriented surfaces.] *Ibid.*, Vol. 36, 1950. 49 p. 28 figs., 8 tables. Nicolet, M. and Dogniaux, R., Pt. 3. *Étude de l'effet des conditions atmosphériques*. [Study of the effect of atmospheric conditions.] *Ibid.*, Vol. 40, 1950. 53 p. 10 figs., 18 tables, refs., eqs. **DLC**—A detailed study of the heat received from the sun. Pt. I opens with calculations based on solar constant, air mass and absorption at Uccle in very fine weather, giving hourly values on a surface normal to the sun and a horizontal surface. Pt. II gives corresponding 1-hourly values of direct solar radiation on walls facing S., S.E. or S.W., E. or W., N.E. or N.W. and N. at 10-day intervals, also annual and diurnal variations of totals. In Pt. III effect of atmospheric conditions (mainly cloud) is introduced, using duration of bright sunshine and its relation to actinometer values. Effective insolation is tabulated by ½-hours and converted to energy under

551.521.1

average conditions at Uccle on variously oriented surfaces. The papers contain many valuable tables and diagrams. (*Same item as 2.11-91, Nov. 1951, MAB.*) *Subject Headings:* 1. *Insolation* 2. *Solar heating* 3. *Belgium.*

## 7B-66

551.584.61:551.578.46

\*Oikawa, M., *Dwelling houses in areas of deep snow cover.* *Seppyo (Snow and Ice)*, Tokyo, 11(4):119-122, 1949. tables. In Japanese. DWB—Tests show difference in temperature between side of house which is heated and the opposite side under different conditions of snow cover. Data are presented in tables. *Subject Headings:* 1. *Indoor climates* 2. *Snow effects on dwellings* 3. *Japan.—M.R.*

## 7B-67

551.584.61:644.1(42)

Weston, John C., *Heating research in houses.* *Institution of Heating and Ventilating Engineers, Journal*, 17(169):235-267, Aug. 1949. 16 figs., 5 tables, foot-refs. Also his: *Heating research in occupied houses.* *Ibid.*, 19(189):47-108, May 1951. 21 figs., 4 tables, 10 refs. Discussion p. 81-108. DLC—The first paper describes research in pairs of unoccupied semidetached houses at Abbots Langley, Herts, with different heating systems in the winter of 1947-48. The results are given in therms, tons of coal, annual and capital cost, amenity and efficiency. The second paper describes a complete research after the houses were occupied. Temperatures were recorded at 9 points in each house, with outside temperature and wind speed. Results are tabulated and analyzed in relation to thermal input and cost of fuel and power. Some suggestions are made about house design, space heating and ventilation. A long technical discussion followed. *Subject Headings:* 1. *Indoor climates* 2. *Heating of houses* 3. *England.—C.E.P.B.*

## 7B-68

551.586:551.524:612.5

†Winslow, Charles-Edward Amory and Herrington, L. P., *Temperature and human life.* Princeton, N. J., Princeton Univ. Press, 1949. 272 p. 39 figs., tables, 151 refs. DWB—The results of years of basic research on respiration, metabolism and other problems of physiology related to adjustment of the human body to its environment have been presented systematically in this book for the benefit of air conditioning engineers and those interested in the effect of climate or weather on clothing requirements, disease, etc. There are seven pages of bibliography and a comprehensive author and subject index. (*Same item as 4-139, April 1950, MAB.*) *Subject Headings:* 1. *Climate and health* 2. *Clothing requirements* 3. *Air conditioning.*

## 1950

## 7B-69

551.582.3(569.4)

Ashbel, Dov, *Bio-climatic atlas of Israel.* Jerusalem, Meteorological Dept. of the Hebrew University, 1950. 151 p. 315 figs. In English and Hebrew. DWB—Extensive climatic data for Israel are presented in diagrams, graphs and maps. Of particular interest from the point of view of indoor climate is the chapter on solar radiation (p. 63-73) which includes, among others, monthly values of solar radiation intensity according to sun altitude, and on walls of different orientation; daily totals of insolation on walls in the different months; and daily amount of insolation on a surface unit of walls of any orientation (diagram). (For fuller abstract, see 4.6-1, June 1953, MAB.) *Subject Headings:* 1. *Climatic atlases* 2. *Design data* 3. *Solar radiation* 4. *Israel.—G.T.*

## 7B-70

551.58(02)

†Brooks, C. E. P., *Climate in everyday life.* London, Ernest Benn, 1950. 314 p. 34 figs., 26 tables, 3 append. (tables, 155 refs.) DWB—In Ch. 2 (p. 56-94) the relation of climatic factors to the planning of houses and factories is discussed and climatic design data are presented in tables and diagrams. Ch. 11 (p. 233-257) takes up general problems of heating, air conditioning, lighting and clothing. (For fuller abstract, see 2.1-149, Jan. 1951, MAB.) *Subject Headings:* 1. *Architectural climatology* 2. *Heating and ventilating* 3. *Climatology.—G.T.*

## 7B-71

551.584.6:629.13

Buettner, Konrad, *Heat and cold in aircraft.* (In: *German aviation medicine, World War II.* Wash., D. C., Govt. Print. Off., 1950. v. 2. p. 757-765. 2 figs., 3 tables, 11 refs., 2 eqs.) DWB—The cabin "climate" of airplanes is considered as a function of air and wall temperature, solar radiation and wind. A device for measuring the perception of thermal climate, the "Frierkörper," which is a modification of the Pfeleiderer frigorigraph is described and its use is illustrated. Temperatures encountered in airplane cabins during flight and means for obtaining physiological suitable temperatures are discussed. Conditions in parked aircraft are considered. Methods for calculating cabin heating and insulation are presented. Instructions for medical officers to secure protection against heat in aircraft and tents are outlined. (*Same item as 5.5-206, May 1954, MAB.*) *Subject Headings:* 1. *Airplane cabin climates* 2. *Comfort climate.—I.L.D.*

## 7B-72

551.586:628.8:656.6

Bullen, F. L., *The ventilation and heating of ships*. 3rd ed. Liverpool, Ch. Birchall & Sons. 1950. 176 p. 53 figs., 25 tables, 29 refs. Price: 10/6. Review by C. E. N. Frankcom in *Marine Observer*, 21(151):32-34, Jan. 1951. GB-MO—This useful textbook opens with a chapter on the density, heat content, etc. of dry and moist air. The volumes of air required to maintain standards of purity and needs of humans and animals, and the standard frequencies of air changes in different parts of a vessel are tabulated. Methods of ventilation are examined, with special reference to efficiency of fans and ducts. Ventilation and refrigeration of cargoes, cooling and ventilation of engine rooms, and the ventilation and heating of crew and passenger accommodation, are discussed, with chapters on air conditioning and testing. (Same item as 4.5-212, MAB.) Subject Headings: 1. Heating and ventilating 2. Shipping.—C.E.P.B.

## 7B-73

551.510.41:551.584.43:633.491

Crook, E. M. and Watson, D. J., *Studies on the storage of potatoes, [and] The temperature conditions inside potato clamps, [and] The composition of the atmosphere in a potato clamp*. *Journal of Agricultural Science*, Cambridge, Eng., 40(3):199-232, July, 1950. 14 figs., 10 tables, 13 refs. Abstracted from reprint. DLC—Thermograph bulbs were placed in a potato clamp 8'6" across and 3'4" high covered by 5 in. straw and 6-15 in. earth. It was found that clamp temperatures were 1-5°C above air temperature (rising to 20°C when potatoes rotted) and followed major but not minor variations of air temperature. Diurnal variation did not penetrate straw. Temperature was higher on leeward than on windward side. The composition showed a gradual increase of CO<sub>2</sub> from 0.06 to 0.86%, decreasing during windy periods. CO<sub>2</sub> production and corresponding oxygen depletion had no practical effects. (Same item as 4.6-71, June 1953, MAB.) Subject Headings: 1. Potato storage 2. Rick temperatures.—C.E.P.B.

## 7B-74

551.571:629.123

Duly, S. J., *The ventilation of ships' holds*. *Royal Society of Arts, Journal*, 98(4825):710-722, July 14, 1950. 8 figs. Discussion p. 722-725. DLC—The problem is that holds should be ventilated continuously to get rid of moisture disengaged from the cargo, but the dew point of sea air is often above the temperature of the cargo, which remains steady owing to its bulk. Temperature differences within a ship are another difficulty. To meet these problems, the Cargocaire system of ventilation and dehumidification was designed. Various machines and devices are described. Drying is by silica gel or refrigeration. Subject Headings: 1. Humidity effects 2. Ships' cargo protection.—C.E.P.B.

## 7B-75

551.521.1:69

Everetts, John, Jr., *The role of climatology in air conditioning design*. *Heating and Ventilating*, 47(3):73-76, March 1950. 2 photos., 4 tables. DLC—The effect of solar radiation and heat storage on heating or cooling load, especially with different facing walls of homes, factories and theaters under different climatic conditions (Chicago, St. Louis and New Orleans) are discussed and illustrated. Value of climatic data stressed. (Same item as 8-53, Aug. 1950, MAB.) Subject Headings: 1. Solar radiation 2. Industrial climatology 3. Heating and ventilating 4. Building design.—M.R.

## 7B-76

551.584.61

Furukawa, G., *Method for evaluation of indoor climate in cold district*. *Seppyo (Snow and Ice)*, Tokyo, 12(3):275-278, 1950. figs. In Japanese. DWB—To evaluate the efficiency to protect against cold, the following measurements were made: increase the indoor temperature by 30°C abruptly, then measure the half decay period in minutes as it cools to the original temperature. Values of 3-12.5 min. were obtained for several Japanese houses. Subject Heading: 1. Indoor climates.—H. Arakawa.

## 7B-77

551.5:691.2

Garston, England: Building Research Station, *The weathering, preservation and maintenance of natural stone masonry*, pt. 1. *Its Digest*, No. 20, July 1950. 8 p. 5 figs. Pt. 2. *Ibid.* Aug. 21, 1950. 8 p. DLC—The nature of natural stone building materials is explained. Causes of decay include atmospheric pollution, especially sulfur fumes (soot also causes discoloration) and soluble salts derived from the soil or clinker bedding below paving and carried upwards by moisture, or derived from brick or concrete copings or sills and carried downwards. Prevention by damp proofing is described. Other causes of decay are contamination with sea salts (near the sea) and other accidental causes such as leakage from kitchen sinks. Pt. 2 discusses damage by frost, thermal expansion, corrosion of steel, vegetation, bacteria, etc. Methods of protection, cleaning and repair are described, including protection from rain penetration. (Same item as 5J-68, Oct. 1954, MAB.)

*Subject Headings:* 1. Building materials 2. Weathering 3. Rain penetration.—C.E.P.B, G. J. Evans.

7B-78

551.584(02)

†Geiger, Rudolf, *Das Klima der bodennahen Luftschicht. Ein Lehrbuch der Mikroklimatologie.* [Climate near the ground. A textbook of microclimatology.] 3rd ed. rev. and enl. Brunswick, F. Vieweg, 1950. 460 p. 195 figs., tables, bibliog. p. 408-446. English transl. of 2nd ed. by Milroy N. Stewart and others, Cambridge, Harvard Univ. Press, 1950. DWB—In Ch. 25, measurements made in various countries in different types of caves are reported and data on temperature, humidity, wind and light penetration obtained in such measurements are presented. Ch. 37 deals with the effect of microclimate on animals and discusses the microclimates of various animal habitations, such as ant hills, termite mounds, rabbit holes, etc. In Ch. 38, problems of the microclimate of human dwellings, of barns and of greenhouses are discussed. Ample reference to pertinent literature is provided throughout these chapters. (Same item as 4B-214 and 4C-291, Feb. and March 1953, MAB; for Engl. transl., see 2.1-158, Jan. 1951, MAB.) *Subject Headings:* 1. Microclimatology textbooks 2. Cave climates 3. Indoor climates—G.T.

7B-79

551.571:628.8

Goethe, S. P., *Determination of minimum air requirements for summer air conditioning Florida.* Univ. College of Engineering, Technical Paper Series, No. 47, 4(6):21-31, June 1950 5 figs., table, 3 refs., 3 equations. Reprint from *Florida Engineering Journal*, April 1950. DWB—A discussion with useful charts and nomograms of the psychrometric principles of total air determination, to serve as guide for air conditioning engineers to use in determining the optimum total amount of air that can be circulated for summer air conditioning. This can be done by means of lines drawn on a psychrometric chart and other calculations. However, the ideal condition of minimum total air (supply temperature at a minimum) cannot be realized because of cost and humidity factors. For example, insulation of ducts may be necessary if supply temperatures are very low. (Same item as 3.3-168, March 1952, MAB.) *Subject Headings:* 1. Air conditioning 2. Humidity measurement.—M.R.

7B-80

551.521:69

Hand, I. F., *Insolation on clear days at the time of solstices and equinoxes for latitude 42°N.* *Heating and Ventilating*, 47(1):92-94, Jan. 1950. 3 figs., 2 tables. DLC—Tables and graphs show hourly values of insolation for various exposures (vertical, horizontal, normal and diffuse and facing different directions), on the 21st of March, June, Sept. and Dec. at 42°N. Also variations in energy received at noon on cloudless days given for average and for actual dates (1947). (Same item as 8-52, Aug. 1950, MAB.) *Subject Headings:* 1. Insolation 2. Building design.—M.R.

7B-81

551.521.14:69

\*Hutchinson, F. W., *Solar irradiation of walls and windows. Southeast and Southwest: October-April.* *Heating, Piping & Air Conditioning*, 22(12):106-108, Dec. 1950. tables. DLC—"Second group of four of a complete series of tables for use by heating, air conditioning and illuminating engineers in evaluating the instantaneous rate of direct solar irradiation in any vertical wall, at any time, in any place." *Subject Headings:* 1. Solar irradiation 2. Building design.—Author's text.

7B-82

551.581:69(213)(6)

Jennings, J. E. and Roux, A. J. A. (both, Nat. Bldg. Research Inst., C.S.I.R. Pretoria), and Connell, P. H. (Univ. of Natal), *Housing in hot climates.* (In: African Regional Scientific Conference, Johannesburg, Oct. 17-28, 1949, [Proceedings] 2:364-367. pub. 1950. French summary p. 364.) DWB—The high atmospheric temperature and radiation of Africa give rise to special building problems which involve comfort considerations and economic and design factors. The authors review briefly some of the research work carried on in South Africa on the thermal balance of buildings, on the deterioration of paint and bituminous films, verminproofing of buildings, effect of arid climates on foundation soils, on building design for outdoor living and details of house design. (Same item as 4.5-191, May 1953, MAB.) *Subject Headings:* 1. Building construction 2. Tropical climatology 3. Africa.—I.L.D.

7B-83

551.584.61:551.578.46

Kimura, Koichiro, *On the winter indoor climate in a district with deep snow cover.* *Seppyo* (Snow and Ice), Tokyo, 12(2):13-20, 1950. figs., tables. In Japanese. DWB—Summarized report on the indoor climate in some Japanese regions with deep snow cover during winter. The indoor climate is generally considered to be quite unhygienic. The indoor air temperatures are slightly higher than the outdoor temperatures, normally 2-5°C, so that indoor humidities are usually

as high as 80%. *Subject Headings:* 1. Indoor climates 2. Snow cover effect on indoor climates.—*H. Arakawa.*

## 7B-84

551.521.1:551.586:69

King, E., *Wiederaufbau und Besonnungsverhältnisse von Bauwerken.* [Rebuilding and insulation of buildings.] *Baden. Landeswetterdienst, Jahresbericht mit Abhandlungen, 1950.* p. 16-30. 7 figs., 7 tables, 4 refs. **DWB**—Sets out hourly tables and diagrams: intensity of total radiation at Baden-Baden on surfaces normal to sun's rays, clear sky; sunshine duration at Freiburg; elevation and azimuth of sun; radiation on vertical walls facing in 16 different directions; and effect of shading by opposite houses. (*Same item as 3.1-106, Jan. 1952, MAB.*) *Subject Headings:* 1. Insolation 2. Bioclimatology 3. Building construction.—*C.E.P.B.*

## 7B-85

551.584:631.56

Kreutz, Wilhelm, *Merkblatt zur Mietenbehandlung. Verminderung von Mietenschäden durch Steuerung des Mietenklimas.* [Pamphlet on crop storage. Reduction of crop damage by means of control of storage climate.] *Germany. Deutscher Wetterdienst in der US-Zone, Mitteilungen, No. 7, June 1950.* 8 p. 5 figs. **DWB**—In storing crops, such as potatoes, in ricks over the winter, consideration must be given to the role of climate in rapid cooling and drying of the stored crop during fall, in protection against winter cold and against unseasonable warming up in fall. The author describes methods of setting up and ventilating ricks in order to attain favorable microclimatic conditions. The winter march of temperature within a ventilated and nonventilated rick during a mild winter is illustrated and comparison is made with the march of temperature during a very cold winter. (*Same item as 2.1-159, Jan. 1951, MAB.*) *Subject Headings:* 1. Crop storage climate 2. Rick microclimatology 3. Agricultural meteorology.—*I.L.D.*

## 7B-86

551.524.37:631.56

Mäde, Alfred, *Zum Mietenklima.* [On the climate of root clumps.] *Meteorologische Rundschau, 3(5/6):135-137, May/June 1950.* 2 figs. **DWB**—Curves show daily temperatures at Königsberg at 7h in winter 1882-83: in air, at ridge of turnip clump, at base of clump on level ground and in troughs 25 and 50 cm deep. Another diagram shows effect of covering with a layer of 50 cm of earth and 10, 15 or 20 cm of dung. Relations to 0°C line show importance of subject. (*Same item as 8-64, Aug. 1950, MAB.*) *Subject Headings:* 1. Rick microclimatology 2. Agricultural climatology 3. Crop storage climate.—*C.E.P.B.*

## 7B-87

551.584.61

Metzler, Karl, *Das Raumklima unter besonderer Berücksichtigung der Süd- und Westseite.* [Room-climate with special regard to the south- and west-sides.] *Annalen der Meteorologie, 3(9-10):291-297, 1950.* 6 figs., 6 refs. **DWB**—To find whether windows of a school building should face S. or W., thermohygrographs were installed in two similar rooms facing S. and W. and compared with screen values. Hourly curves of temperature and humidity are given under various conditions (average, clear and cloudy, closed and ventilated). The W. room shows a high peak temperature on summer afternoons, but in morning, midday and in winter throughout the day, the S. room was best. The effect of radiation is considered and the heating effect of a flat roof found to be important. (*Same item as 2.5-184, May 1951, MAB.*) *Subject Heading:* 1. Indoor climates.—*C.E.P.B.*

## 7B-88

551.5:69

National Research Council, Wash., D. C. Building Research Advisory Board, *Weather and the building industry: a research conference on climatological research and its impact on building design, construction, materials and equipment.* Its *BRAB Research Conference Reports, No. 1, April 1950.* 158 p. figs., tables, bibliog. Mimeog. **DLC**—This report includes a collection of papers summarizing relations of climatology to building, and the present status of research on building materials and equipment. Following opening remarks by C. F. RASSWEILER and T. H. URDAHL, papers were read by SIPLE, P., *Climatic criteria for building construction*, p. 5-22; LANDSBERG, H., *Microclimatic research in relation to building construction*, p. 23-29; and COURT, A., *Climatographic research*, p. 29-33. Then followed four discussions: 1. How can the weather sciences be developed for better use in the building industry? (openers, F. W. REICHELDERFER, Problems and progress in applied climatology for the building industry; H. C. S. THOM, Weather Bureau techniques and specific examples of the Bureau's work); 2. Climate and the structure (H. R. SNOKE, Research on roofing; F. B. ROWLEY, Research on insulation; F. E. GIESECKE, Research on seven houses in Austin, Texas; R. F. LEGGET, Effect of weather on a building test hut program; T. S. ROGERS, Implications of climatology on future materials research); 3. Climate and design of buildings (L. P. HERRINGTON, Human factors in planning for climate control; J. M. FITCH, Buildings designed for climate control); 4. Climate and indoor comfort (C. TASKER, The role of weather

data in heating and air conditioning; J. EVERETTS, JR., Analysis and influence of climatology upon air conditioning design; L. C. BASTIAN, Why not be comfortable?). The results of the conference from the point of view of building technology by C. F. RASSWEILER, p. 141-144, and for the weather sciences by F. R. REICHELDERFER, p. 144-146. (Same item as 2.7-176, July 1951, MAB.) *Subject Headings: 1. Applied meteorology 2. Building research.—C.E.P.B.*

7B-89

551.521.1:621.47:016

†Engineering Societies Library, New York, **Bibliography on domestic and industrial applications of solar heating.** Its *ESL Bibliography*, No. 7. 1950. 20 p. GB-MO—A large number of references with brief abstracts, classified into: 1. General articles and industrial applications, 2. Solar houses and solar water heating. Entries are in order of date (latest first) from 1950 to 1930. *Subject Headings: 1. Solar heating 2. Solar houses.—C.E.P.B.*

7B-90

551.586:636:551.584.61

Radomska, Maria J., **Badania nad mikroklimatem budynkow inwentarskich i jego znaczenie w hodowli i chowie zwierzat domowych.** [Investigations of the microclimate of livestock buildings and its importance in the rearing and breeding of domestic animals.] *Gazeta Obserwatora PIHM*, Warsaw, 3(9):10-13, Sept. 1950. DLC—In Poland, livestock and poultry pass a large part of the year indoors. After stressing the importance of good and healthy conditions (of barn microclimate), the author determines specific optimum conditions for different kinds of animals. (Same item as 3.8-200, Aug. 1952, MAB.) *Subject Headings: 1. Animal husbandry 2. Barn climates.—A.M.P.*

7B-91

551.5:72

Reichel, Eberhard, **Bauwirtschaft und Wetterdienst.** [Building industry and weather service.] *Bauwirtschaft*, Wiesbaden, No. 49:6-7, 1950. DLC—Summarizes briefly effects of climate on planning and construction of buildings and town planning, including utilization of weather forecasts and special advice services for builders in Germany. *Subject Headings: 1. Climatic effects 2. Building design.—C.E.P.B.*

7B-92

551.525.5:69(02) 551.524.37

Ruckli, Robert, **Der Frost im Baugrund.** [Frost in building foundations.] Vienna, Springer, 1950. 274 p. 112 figs., tables, refs., eqs. DWB—A comprehensive monograph giving the results of field observations and of laboratory investigations on ground frost, the results of practical experience with various building methods in frozen ground and presenting a mathematical treatment of the ground frost problem. Pt. I, which is descriptive, covers the following topics: the effects of frost and frost damage in building foundations; types of soil ice, field investigation to explain the phenomenon of frost, frost damage and heaving; systematic observations on the effect of frost on streets and roads; the design of field experiments; effect of pressure, physical chemical properties of soil, soil constituents, etc. upon the freezing of soil; criteria of frost. Pt. II treats the frost problem mathematically and includes the following subjects: climatic frost conditions, correlation between duration, intensity and frequency of cold periods; diffusion of heat in the soil, the theory of temperature relationships in the soil, practical measurements of soil temperature; penetration of frost into the soil; flow of water in the soil and calculation of frost heaving; the influence of surface properties of the soil upon penetration of frost, the application of the principles of analogy to frost experiments; the cold storage problem. Pt. 3 deals with various measures for preventing frost damage and with techniques for analyzing the effects of frost. (Same item as 3.6-114, June 1952, MAB.) *Subject Headings: 1. Frozen soil 2. Frost damage 3. Frost heaving 4. Frost penetration 5. Building construction 6. Industrial meteorology 7. Cold storage.—I.L.D.*

7B-93

551.55:728

Sekiguti, T., **Rural houses and prevailing winds (Local climatological study of the Akaho Fan, Kami-Ina, Nagano Pref. No. 3).** *Papers in Meteorology and Geophysics*, Tokyo, 1(1):67-76, Oct. 1950. 7 figs., 3 tables. DWB—Strong S winds prevail in the Ina valley and the calmest direction is E. Local building practices to meet this situation are described. *Subject Headings: 1. Wind effects 2. Rural architecture 3. Japan.—C.E.P.B.*

7B-94

551.586

\*Sissenwine, Norman, **Synthetic temperature and humidity cycles.** *U. S. Quartermaster Corps. Research and Development Branch, Environmental Protection Section, Report*, No. 165, March 1950. 10 p. 4 figs., 2 tables. DLC, DWB—On the basis of temperature and relative humidity data for the Canal Zone General Depot and San Antonio, Texas General Depot, representing warm temperature and high humidity areas, the author constructed realistic daily cycles of temperature and humidity useful for simulating long term storage conditions in the moist tropics during the rainy season and in temperate regions during hot summer. Tables giving frequency of occurrence

(hours) of combination of temperature and humidity at the Canal Zone for May and June 1949 and at San Antonio for July and Aug. 1949. The synthetic cycles are constructed so that temperature and humidity are proportional to the observed combinations. Also a simple cycle of dew point was determined. *Subject Headings:* 1. Artificial climates 2. Storage in hot humid climates 3. Canal Zone 4. San Antonio, Texas.—I.L.D.

## 7B-95

551.521.16:728.1

Waldram, Percy J., *A measuring diagram for daylight illumination for the measurement of predetermination and representation of natural lighting*. London, Batsford, [1950.] 18 p. 8 figs. (incl. large fold. plate), 8 refs. **DLC**—The construction of a diagram to show direct illumination on a horizontal surface by unobstructed sky light ("sky factor") is described with diagrams, including "Waldram diagram" for practical use. *Subject Heading:* 1. Daylight illumination.—C.E.P.B.

## 7B-96

551.586:628.8

Weiller, A. R., *Sur le problème général de la climatisation*. [On the general problem of air conditioning.] *La Météorologie*, No. 20:245-249, Oct./Dec. 1950. fig., 3 tables. **MH-BH**. Also review by: Jovičić, S., *O problemu klimatizacije*. *Yugoslavia. Hidrometeorološka Služba, Vesnik*: 2(2):61-63, April/June 1953. fig. tables. **DWB**—The ideal for comfort is a temperature of 20°C and relative humidity 52%, but as a sudden change of temperature on leaving a house is undesirable, a low outdoor temperature calls for lower air temperature and higher humidity indoors. Two tables are given for ideal indoor conditions for different outdoor temperatures, one taking account of ventilation and the other of absolute humidity. Example:

|                        |       |    |       |
|------------------------|-------|----|-------|
| Outside temperature °C | -30   | 10 | 50    |
| Inside temperature     | 15    | 19 | 25    |
| Inside humidity %      | 59-63 | 53 | 34-28 |

(Same item as 2.9-163, Sept. 1951, *MAB*.) *Subject Heading:* 1. Air conditioning.—C.E.P.B.

## 7B-97

551.584:551.588.7

Zabaleta, Julio, *La temperatura en la ciudad de Oruro*. [The temperature of the city of Oruro.] *Nimbus*, 2(6-7):41-56, April/Sept. 1950. 17 figs., eqs. **DLC**—A detailed analysis of wind, temperature, insolation and astronomical considerations which would effect the comfort of dwellings of Oruro, Bolivia (elev. 3700 m, lat. 18°S). Schematic diagrams and elaborate nomograms are presented to show the optimum orientation (45°) of dwellings or streets, and vegetation, to make the most of solar radiation for heating, etc. Number of calories received on various walls, at different times of day or season, are worked out on charts. Cooling conditions (radiative) are also considered as well as the climate of the patio. (Same item as 2.11-166, Nov. 1951, *MAB*.) *Subject Headings:* 1. Urban climates 2. Architecture 3. Solar heating 4. Oruro, Bolivia.—M.R.

## 1951

## 7B-98

551.586:72:016

†Abbruzzese, Marie G. (comp.), *Climate and architecture*. Selected references. Wash., D. C.: Housing and Home Finance Agency, Office of the Administrator, Division of Housing Research, March 1951. 20 p. 175 refs. **DLC**—Contains references from various periodicals with brief annotations on relation of weather to building design, comfort, construction, heating and ventilating microclimatology, solar heating and specific work in different states or regions of the U. S., arranged under such headings. (Same item as 6B-88, Feb. 1955, *MAB*.) *Subject Headings:* 1. Bibliography on architectural climatology 2. United States.—M.R.

## 7B-99

551.511:551.524.7

Bedford, Thomas, *Equivalent temperature: what it is, how it's measured*. *Heating, Piping & Air Conditioning*, 23(8):87-91, Aug. 1951. 2 figs., 2 tables. **DLC**—In comparing various methods of determining room temperature, the definition of "equivalent temperature" is quoted as "that temperature of a uniform enclosure with still air in which a sizable black body would lose heat at the same rate as that observed." Such a temperature scale, which accounts for radiant as well as convective heat, has been in use in Great Britain for 20 years. Basic principles of the "eupatheostat," a thermostat based on equivalent temperature, and the application of "comfort votes" for determining optimum room temperature are explained. *Subject Headings:* 1. Equivalent temperatures 2. Indoor temperatures.—G.T.

## 7B-100

551.586:697.9:551.510.42

Brooks, Edward M., *Meteorology and industrial hygiene*. *American Journal of Public Health*: 41:548-552, May 1951. 5 refs. **DLC**—A discussion of the meteorological factors which affect

industrial workers through changes in the pollution of the air inside and immediately outside industrial plants. The efficiency of forced ventilation is liable to be impaired in very cold weather, that of free ventilation in very hot weather. Air pollution outside is affected by stack height, wind speed and turbulence. *Subject Headings: 1. Bioclimatology 2. Ventilation of factories.*—C.E.P.B.

7B-101

551.584.61:697

Chernin, L. B., *K voprosu sanitarnogo normirovaniia mikroklimata zhilykh i drugih grazhdanskikh zdaniĭ massovogo stroitel'stva*. [The hygienic control of the microclimate of dwellings and other large public buildings.] *Gigiena i Sanitariia*, No. 2:14-15, Feb. 1951. 4 figs. **DLC**—The author discusses the problem of heating rooms so that the temperature be evenly distributed within a height of about 6 ft from the floor. The change of air temperature with a height of 15 ft above the floors in rooms heated by various means is shown graphically. Radiant heating of floors results in a uniform temperature. Depending upon type of stone, the difference in temperature between floor and ceiling may be as much as 9°C, and between floor and 10 ft above floor as much as 4°C (14.5° and 18.5°C, respectively). Recommendations for suitable heating of rooms, depending upon their use by children or adults, etc. so as to achieve a maximum comfort and healthfulness are presented. (*Same item* as 3.1-161, Jan. 1952, *MAB*.) *Subject Headings: 1. Microclimatology of dwellings 2. Heating and ventilating.*—I.L.D.

7B-102

551.521.1:620.91

Conference on the sun in the service of man, [**Proceedings**]. *American Academy of Arts and Sciences, Proceedings*, 79(4):181-326, July 1951. figs., tables, refs. **DWB**—This report includes 15 papers. The first group (p. 188-227) deals with energy derived from photosynthesis by plants, crops and forests. LAWRENCE J. HEIDT (p. 228-235) discusses the possibility of **Non-biological photosynthesis in water containing cerium**. Pt. 2, sun-earth relationships, deals with solar atmosphere, ionosphere and effect of solar variability on meteorological anomalies. In Pt. 3, RABINOWITCH, EUGENE, *World's energy supplies and their utilization* p. 296-312, discusses availability and use of current and fossil energy supplied by photosynthesis, including food, and other sources such as water power. HOTTEL, HOYT C., *The engineering utilization of solar energy*, p. 313-318, discusses the efficiency of parabolic reflector and flat black plate collectors as sources of low level heat, such as the solar water heaters in Miami. VON HIPPEL, ARTHUR considers the theory of *Transformation of solar energy*, p. 319-322 and THIMANN, KENNETH V., *Biological utilization of solar energy*, p. 323-326. *Same item* as 4.11-4, Nov. 1953, *MAB*.) *Subject Headings: 1. Solar radiation 2. Solar energy.* I. Shapley, Harlow, (ed.).—C.E.P.B.

7B-103

551.584.61:697.9

Dick, J. B. and Thomas, D. A., *Ventilation research in occupied houses*. *Institution of Heating and Ventilating Engineers, Journal*, 19(14):306-326, Oct. 1951. 10 figs., 11 eqs. **DLC**—Measurements of rate of air change and heat loss due to ventilation in occupied houses are described with various numbers of open windows at an exposed site (Abbotts Langley). Number *R* of air changes per hr is given by  $0.87 + 0.075n + 0.23(n + 1.4m) + 0.027(n + 1.4m)v$  where *v* is wind speed mi/hr, *n* is the number of top-hung vents open and *m* is number of side-hung casements open, mean *v* 8.5 mi/hr. Number of windows open is related to external temperature (70%) and wind speed (10%). At a sheltered site (Bucknalls Close), mean wind 4.5 mi/hr, the "stack" effect due to temperature difference  $\Delta T$  inside-outside predominated. Effect of wind was given by

$$R\mu = (0.16 + 0.036n + 0.14m)v$$

and of

$$\Delta T \text{ by } R_{\Delta T} = (0.22 + 0.071n + 0.14m)\Delta T^{\frac{1}{4}}$$

The average rate of heat loss from occupied houses is estimated as 6-8 therms per week, corresponding to air change rates of 2-3/hr. (*Same item* as 5.2-173, Feb. 1954, *MAB*.) *Subject Headings: 1. Indoor climates 2. Ventilation of houses.*—C.E.P.B.

7B-104

551.588:71

Egli, Ernst, *Die neue Stadt in Landschaft und Klima*. Climate and town districts, consequences and demands. Erlenbach-Zurich, Verlag für Architektur, 1951. 155 p. 99 figs. In German and English. **DLC**—The first part of the book discusses the evolution of modern town forms. Pt. 2, town structure and climate, sets out the effects of different climatic zones, acting through sun, rain, wind, drought, dust, heat and cold, on the houses and town forms, with numerous illustrations which are classified into types. This is completed by studies of the layout of several ancient towns with special reference to prevailing winds. Pt. 3 relates town structures to landscapes, the response to a given landscape also differing according to the climatic zone; it ends with recom-

mendations for town planning or extension in different climates. (Same item as 3G-243, July 1952, MAB.) *Subject Headings:* 1. Town planning 2. Climatic influences.—C.E.P.B.

## 7B-105

551.501.42:551.521.32

Foxhall, William B., **Handling sun loads on buildings.** *Heating and Ventilating*, New York, 48(4):76-80, April 1951. 5 figs., 3 tables, 8 refs. **DLC**—Author sums up methods of calculating sun loads as found in various recent publications. The construction of a chart showing the pathway of the sun at any latitude throughout the year is explained. Equations are presented for calculating angles of incidence, length and depth of shadow, eave overhang and solar intensity. Data for effective solar absorption by various paints and materials, heat transmission coefficient of glass and fraction of incident solar radiation through glass are given in tables. (Same item as 3.7-30, July 1952, MAB.) *Subject Headings:* 1. Solar radiation 2. Solar radiation effects 3. Building materials 4. Air conditioning.—G.T.

## 7B-106

551.584.61:697.1

Garston, England. Building Research Station, **Heat loss from dwellings.** *Its Digest*, No. 35, Oct. 1951. 5 p. 2 tables. **DLC**—Heat loss is analyzed in terms of the thermal transmission *U* of the external shell, rate of air change through gaps and apertures, temperature difference between inside and outside, area of external walls, roof, windows and doors, position of flues and type of heating apparatus. Methods of calculating average hourly heat loss in B.t.u./hr are outlined, with examples, and suggestions are given for reducing heat loss. *Subject Headings:* 1. Heat loss from buildings 2. Indoor climates 3. Building research.—C.E.P.B.

## 7B-107

551.5:697.9

Garston, England. Building Research Station, **The principles of natural ventilation of buildings.** *Its Digest*, No. 34, Sept. 1951. 6 p. 6 figs. **DLC**—Discusses with diagrammatic illustrations the flow of air through a building due to wind pressure on inlets and negative pressure on outlets, and "stack effect" resulting from temperature difference between air inside and that outside a building, or to a heated flue. Ventilation flow in cu ft/hr (with inlets and outlets equal) = 3150 (area of inlets in sq ft) times wind speed in mi/hr. The corresponding stack effect is 540 (area of inlets)/(ht in ft between inlets and outlets  $\times$  temperature difference  $^{\circ}$ F). Both expressions require different constants for different ratios of outlets to inlets. The influence of the building plan is also considered. (Same item as 5J-212, Oct. 1954, MAB.) *Subject Headings:* 1. Ventilation of buildings 2. Wind effects.—C.E.P.B.

## 7B-108

551.584.61:551.524

Gormosov, M. S., **Mikroklimat zhilishch i ego gigenicheskoe izuchenie.** [Microclimate of dwellings and its investigation.] *Gigiena i Sanitariia*, 8:3-11, Aug. 1951. 2 tables. **DLC**—Soviet work on the comfort temperatures of dwellings in various climatic regions of the U.S.S.R. is reviewed; the physiological basis of temperature regulation is discussed briefly; and names of Soviet investigators studying comfort temperatures are listed. The results of a questionnaire study of optimum winter temperatures in diverse climatic zones (I—cold; II—moderately cold; III—temperate; IV—warm; V—hot) are given. Replies were received from 3722 individuals of both sexes aged 18 to 65 yrs. The winter comfort temperatures were highest in the cooler zones and lowest in the warmer zones: below 20 $^{\circ}$ C in the hot zones and between 20-22 $^{\circ}$ C in the cold zone. The distribution of winter temperatures within dwellings situated in these climatic zones corresponded to the comfort questionnaire data. Comfort indoor temperatures for residences established in various zones of the U.S.S.R. are given; these are viz: I, 21-22 $^{\circ}$ C; II, 18-21 $^{\circ}$ C; III, 18-20 $^{\circ}$ C; IV, 17-19 $^{\circ}$ C; V, 17-18 $^{\circ}$ C. Also results of experimental study of effect of atmospheric temperature upon skin temperature and electrical conductivity of skin are given. (Same item as 4.2-247, Feb. 1953, MAB.) *Subject Headings:* 1. Indoor climates 2. Indoor temperatures 3. Physiological climatology 4. Comfort climate 5. U.S.S.R.—I.L.D.

## 7B-109

551.584.61:628.83

Holleman, Theo. R. (*Texas Eng. Ex. Stat.*), **Air flow through conventional window openings.** *Texas. Agricultural and Mechanical College. Engineering Experiment Station, Research Report*, No. 33, Nov. 1951. 45 p. illus. 5 refs. **DWB**—The author distinguishes between winter ventilation, when an upward flow ventilating the room is desirable, and the summer ventilation, when the air flow should be directed on the inhabitants. He uses acid smoke from titanium tetrachloride to make the air flow visible. An experimental building and air flow chamber with window models served for the tests of the main conventional window openings. With "hung" openings the air flow can be directed in different desirable levels; with vertical vane openings, a broad distribution of air flow can be reached. Jalousie windows make it possible to direct the air flow not only upwards

but also downwards. Numerous sketches accompany the paper. (Same item as 5.6-257, June 1954, MAB.) *Subject Headings:* 1. Indoor climates 2. Ventilation of buildings.—A.A.

7B-110

551.584.61(52)

Inoue, T., On the result of observations in Treasury (The Nara National Museum Treasury). *Journal of Meteorological Research*, 3(6):215-219, March 1951. 4 figs., tables, eqs. In Japanese; English summary p. (14). DWB—Temperature, relative humidity and vapor pressure were recorded from Jan. to April 1950 and the data are presented. (Same item as 3.9-205, Sept. 1952, MAB.) *Subject Headings:* 1. Indoor climates data 2. Museum climates 3. Nara, Japan.

7B-111

551.594:551.584.61

Israël, Hans and Kasemir, H. W., Ueber die Schirmwirkung von Gebäuden auf die Schwankungen des atmosphärisch-elektrischen Feldes. [Protective influence of buildings on the variations of the atmospheric-electric fields.] *Annales de Géophysique*, 7(1):63-68, Jan./March 1951. 2 figs., 5 ref., 24 eqs. French and English summaries p. 63. DLC—A method of calculation of the reduction of electric fields of varying frequency in traversing a building with poor conductivity was devised and tested to determine whether electric conditions are the same indoors as out. Useful in meteoropathologic experiments. Effects on dust, humidity and ionization in rooms are suggested. The shielding depends entirely on the frequency of the field. At high frequencies the shielding is complete—at very low frequencies (daily waves of magnetic field) the shielding is very slight. (Same item as 3.11-274, Nov. 1952, MAB.) *Subject Headings:* 1. Atmospheric electricity 2. Indoor climates.—M.R.

7B-112

551.584.61:551.586:697

Kamiyama, K.; Suzuki, T. and Kawamori, M., A survey on the dwelling conditions of community house from the climatological point of view. *Papers in Meteorology and Geophysics*, Tokyo, 2(1):90-94, March 1951. fig., tables, eqs. DWB—The climatic suitability of the 1000 dwellings at Toyama Heights, Tokyo was investigated by means of questionnaires given to the residents which were sampled at random at a 1 to 5 sampling ratio. It was found that 70.2% of the tenants partitioned their room in order to give protection against cold. (Same item as 3G-246, July 1952, MAB.) *Subject Headings:* 1. Indoor climates 2. Heating and ventilating 3. Tokyo, Japan.—I.L.D.

7B-113

551.506:697

Lacy, R. E., Variations of the winter means of temperature, wind speed and sunshine, and their effect on the heating requirements of a house. *Meteorological Magazine*, London, 80(948):161-165, June 1951. fig., 2 tables, 3 eqs. Also: Gold, Ernest and Lacy, Ralph Edward, Heating requirements of a house. *Ibid.*, 81(960):185-186, June 1952. DWB—Equations are given connecting mean and variance of winter fuel requirements of a house with means and variances of temperature, wind speed and sunshine. Values are given for Kew Observatory. (Same item as 3.3-34, March 1952, MAB.) E. GOLD calls attention to an inconsistency in LACY's expression for heating requirements, and suggests that it is due to the effect of convection. LACY replies. *Subject Headings:* 1. Climatological prediction 2. Heating and ventilating.—C.E.P.B.

7B-114

551.58:69

Lee, Douglas H. K., Thoughts on housing for the humid tropics. *Geographical Review*, 41(1):124-147, Jan. 1951. 26 figs. DLC—This article, illustrated by 24 excellent photographs of suitable and unsuitable types of building, sets out the amount of radiation falling on roof and walls, reflection by paint of various colors, insulating effect of different materials and of air spaces, and protection against rain. The greatest trouble is high vapor pressure, hence thorough ventilation is important and there should be no cross-wind partitions. Floor structure and house planning is discussed. Examples of houses are described for India, E. Africa, Nigeria, Australia and Puerto Rico, with costs. (Same item as 3G-233, July 1952, MAB.) *Subject Headings:* 1. Building construction 2. Tropics.—C.E.P.B.

7B-115

551.586:628.8

Likely, Wadsworth, Climates made to order. *Science News Letter*, 60(12):186-187, Sept. 22, 1951. DWB—Brief popular report on the Army Engineers Fort Belvoir laboratory and other similar establishments maintained by the Armed Forces for testing military equipment in artificially created extreme climatic conditions. One of the test chambers is shown on the magazine's front page photograph. (Same item as 5.4-239, April 1954, MAB.) *Subject Headings:* 1. Artificial climates 2. Climatic laboratories.—G.T.

7B-116

551.584.65

Montoriol Pous, Joaquin, *Meteorología hipogea*. [Subterranean meteorology.] *Urania*, Barcelona, 36(228):225-246, Oct./Dec. 1951. table, 14 figs., bibliog. DWB—This study of the

meteorology of the caves of Spain and the Balearic Islands includes water and air temperatures at depths to 300 in below ground, a discussion of the heat balance and thermal circulation of the air and formation of subterranean fogs by mixing saturated air masses at different temperatures. (*Same item as 4.3-261, March 1953, MAB.*) *Subject Headings: 1. Cave temperatures 2. Microclimatology of caves.—C.E.P.B.*

7B-117

551.521.3:551.521.2

Parmelee, George V. and Aubele, Warren W., *Radiant energy emission of atmosphere and ground: a design factor in heat gain and heat loss.* *Heating, Piping and Air Conditioning*, 23 (11): 120-129, Nov. 1951. 11 figs., table, eqs. **DLC**—Equations and experimental data obtained with a special radiometer are presented for low temperature long wave length radiation exchange between buildings and the atmosphere and ground. Heat flow data on sunlit glass are graphically represented. Heat loss on cloudless night is compared to heat loss when sky is overcast. The factor of radiation exchange is adapted to design calculation purposes. (*Same item as 3.11-132, Nov. 1952, MAB.*) *Subject Headings: 1. Terrestrial radiation 2. Heat exchange 3. Building design.—G.T.*

7B-118

551.5:72 (54)

Raychaudhuri, B. C., *Comforts and buildings.* *Science and Culture*, Calcutta, 17 (5): 199-202, Nov. 1951. 3 refs. **DLC**—In India main consideration is to minimize penetration of solar heat into buildings by conduction through walls, absorption by walls, and infiltration of air; methods of achieving this are insulated false ceilings, cavity bricks, whitewashing, projecting eaves, screens, etc. Climatic data required and desirable research in India are summarized. (*Same item as 3.9-23, Sept. 1952, MAB.*) *Subject Headings: 1. Building design 2. India.—C.E.P.B.*

7B-119

551.582:69 (43)

Reidat Rudolf, *Bauwesen und Wetterdienst.* [Architecture and weather service.] *Der Deutsche Holzbau*, No. 7/8, 1951. 11 p. 12 figs. Abstracted from reprint. Foreword by Dr. Dammann. **DWB**—This discussion sets out the form in which climatic data in Germany are available to the architect, with examples mainly for Hamburg. Solar radiation on flat surfaces, walls and slopes of 30° and 60°, facing N., E., S. and W., conversion of this radiant energy to heat, and losses by radiation and convection are set out. Effect of wind is discussed. Penetration of rain into walls is considered with precipitation wind rose; heat insulation by fresh and compacted snow, and penetration of cold and humidity into various building materials are described with diagrams. (*Same item as 3.8-172, August 1952, MAB.*) *Subject Headings: 1. Building design 2. Building materials 3. Climatic influences. I. Dammann, Walter.—C.E.P.B.*

7B-120

551.582:72:697 (73/9)

\*Rogers, Tyler Stewart; Siple, Paul A.; Queer, Elmer; Fisher, Howard T. and Callender, John Hancock (all, *Owens-Corning Fiberglass Corp.*), *Design of insulated buildings for various climates.* Toledo, Ohio, Roberts Printing Co., 1951. 119 p. 8 tables, illus. **DWB**—A popular but practical work on how climate or weather affects comfort and building design with particular reference to conditions in the U. S., and based on weather and materials data accumulated for this purpose during and since the war. The major sections deal with: 1) heat control (effect of materials in controlling conduction, convection, reflection, etc. in summer and winter); 2) Vapor control (condensation, insulation, vapor barriers, summer condensation); 3) Ventilation (effect of wind movement, air cooled walls and roofs, design for hot or sunny climates) and 4) Design data for practice with respect to roofs, ceilings, walls, floors and the calculations of design data. Many climatic tables and maps, photos and schematic diagrams, and an elaborate index add to the usefulness of this volume. (*Same item as 4.5-193, May 1953, MAB.*) *Subject Headings: 1. Climatic effects 2. Building design 3. Heating and ventilating 4. Indoor climates 5. United States.—M.R.*

7B-121

551.584.61

Saito, Hirohide, *On the indoor climate.* *Seppyo (Snow and Ice)*, Tokyo, 13 (3): 94-97, 1951. diags., eqs. In Japanese. **DWB**—Micrometeorological observations of the indoor air temperatures in wooden houses in Japan including the minimum temperature in the early mornings and the radiational heating from stoves. *Subject Headings: 1. Indoor climates 2. Japan.—H. Arakawa.*

7B-122

551.584.61

\*Sissenwine, Norman, *Temperature and humidities in army warehouses.* *U. S. Quartermaster Corps. Research & Development Branch. Environmental Protection Section, Report No. 174*, Jan. 1951. 12 p. 5 tables. **DWB**—In order to answer questions concerning the storage life of various quartermaster items and to indicate the relative suitability of depots for the storage of these items, temperature and relative humidity measurements were made for 12 months and 21 storage depots. Continuous temperature and humidity observations were made with a Bourdon tube thermograph.

and hair hygrometer respectively at a high and low elevation. In each of the depots data are given for the departures of monthly temperatures from long term averages and weather stations nearest each of the depots, average monthly temperatures in the army depots at high and low positions, percent of time during a year that temperature and relative humidity exceed 70°F and 40%, minimum humidity requirements for microbiological activity and number of hours of significant microbiological activity. *Subject Headings:* 1. Warehouse microclimatology 2. Storage microclimatology. —I.L.D.

## 7B-123

551.524.36:632

Smith, L. P., *Temperatures under dutch lights*. *Meteorological Magazine*, London, 80(944): 50-52, Feb. 1951. 5 tables. DWB—Shielded distant-reading thermographs were installed 4-5 in. above ground in two cold frames and in open. The minima were higher in the 2-light than in the 5-light frame by 0.6°F (Feb.) to 3.9° (June); both were 3-5°F higher than in the open, the difference increasing with the preceding day's sunshine. Difference between maxima in frames and open is given by  $D = 0.2n + 2.5h$ ;  $n$  = number of days after Jan. 31,  $h$  total sunshine in hours up to 13 h. (Same item as 2.8-88, Feb. 1951, MAB.) *Subject Headings:* 1. Temperature variations 2. Microclimatology of frames.—C.E.P.B.

## 7B-124

551.521.16:728.1

Spencer, Domina Eberle and Stakutis, Vincent J., *The integral-equation solution of the day-lighting problem*. *Franklin Institute, Phil., Journal*, 252(3):225-237, Sept. 1951. 43 figs., 14 refs., eqs. DLC—The problem of calculating the natural lighting of a long room with windows along one wall is examined mathematically assuming a non-uniform sky and interreflections of light in the room. A formal solution is obtained. *Subject Heading:* 1. Daylight illumination.—C.E.P.B.

## 7B-125

551.521.3:629.13

Spillmann, Werner, *Der Wärmeaustausch durch Strahlung an fliegenden Körpern*. [The heat exchange by radiation in flying bodies.] *Zeitschrift für angewandte Mathematik und Physik*, 2(6): 470-484, 1951. 6 figs., 7 refs., 29 eqs. DLC—Discusses the heat economy of an object flying at great heights. Factors considered are solar constant, absorption of radiation by the atmosphere (0-14 km), radiation of individual layers of the atmosphere, of cloud sheets and of the earth, and heat loss by radiation from a pressurized aircraft cabin. Numerical results shown graphically. Results also applied to heating technique of greenhouses, swimming pools, etc. (Same item as 3.5-185, May 1952, MAB.) *Subject Headings:* 1. Heat economy of enclosures 2. Airplane cabin climates.—C.E.P.B.

## 7B-126

551.524.36:662.9

Sporn, Philip and Ambrose, E. R., *Tests show how heat pumps perform in different climates*. *Electrical World*, New York, 135(7):97-100, Feb. 12, 1951. diagr., tables, photo., refs. DLC—Chart tables show expected performance of heat pumps in test houses at 5 different locations in the U. S.: South Bend, Ind.; Coshocton, Ohio; Roanoke and Abingdon, Va. and Kingsport, Tenn., based on degree-days in normal heating season, and in test period, May 1949-April 1950. (Same item as 3.8-112, August 1952, MAB.) *Subject Headings:* 1. Heat pumps 2. Degree-day data 3. Eastern United States.—M.R.

## 7B-127

551.524:551.586:697

Weston, J. C., *Heat requirements of houses*. *Institution of Heating and Ventilating Engineers, London, Journal*, 18(185):388-398, 1951. 2 figs., 4 tables, 9 eqs. DLC—Five types of insulation in four types of houses were tested for loss of heat and regression equations were calculated giving heat loss in terms of floor area and insulation of floors, walls and ceilings, with an allowance for loss by ventilation, etc. This is applied to show the advantage of improved insulation. (Same item as 3.2-102, Feb. 1952, MAB.) *Subject Headings:* 1. Indoor temperatures 2. Insulation 3. Industrial climatology.—C.E.P.B.

## 1952

## 7B-128

551.584.61:536.24

Akai, S. (Tottori Weather Station), *On the upward transmission of heat in the air of heated room*. *Geophysical Magazine*, Tokyo, 23(4):359-365, May 1952. 5 figs., 6 tables, 10 eqs. DWB, DLC—A theoretical equation is developed for calculating the volume transmission coefficient (Austausch coefficient divided by density of air which is assumed to be constant) which represents "the total volume of air passing through a horizontal plane of unit area in unit time including microscopic eddies in the case when the vertical distribution of air temperature" in a room heated by a stove is in steady state. Using observational data, the author computed the rate of spontaneous cooling of a room after suspension of heating, the cooling constant; and the volume transmission coefficient.

The calculated atmospheric room temperature of various elevations and the floor correspond closely to observed values. *Subject Headings:* 1. Indoor air 2. Heat exchange.—I.L.D.

7B-129

551.582(569):

Ardon, Ya'acov. **Harnessing the climate in Israel.** *Weather*, 7(6):176-177, June 1952. DWB—Account of work of techno-climatological research station set up by Haifa Technion in May 1951 on indoor climate, heat-insulating properties of building materials, use of solar energy, etc. *(Same item as 4.1-208, Jan. 1953, MAB.)* *Subject Headings:* 1. Applied climatology.—C.E.P.B.

7B-130

551.524.35:551.573:628.8

Bacon, R. A. and Long, W. E. *Univ. of Texas, Austin*. **Evaporative cooling of a residential roof.** *Heating and Ventilating*, New York, 49(11):79-82, Nov. 1952. 9 figs. DWB—An investigation of the action of roof spray in modifying temperatures on ceramic houses built by the Aeronautics Ceramic Housing Project in Austin, Texas. The roof construction, the sprinkler system which was operated by an automatic control in which a wet-bulb thermostatically operated 24-volt solenoid valve controls the flow of water to the roof, the temperature measurement and test procedure are described. The test results for the three rooms tested are presented graphically, and they show that during sprinkling the heat flow was from the room to the roof and room temperatures were as much as 5°F lower than without sprinkling. *Subject Headings:* 1. Evaporative cooling 2. Cooling of houses 3. Austin, Texas.—I.L.D.

7B-131

551.584.61:631.

Bingham, E. W. **A greenhouse in the Antarctic.** *Polar Record*, 6(48):392-393, Jan. 1952. 2 photos. DLC—Account of a successful greenhouse on Stonington Island, 68°7'S. *(Same item as 3.8-189, Aug. 1952, MAB.)* *Subject Headings:* 1. Greenhouse climates 2. Stonington Island Antarctica.—C.E.P.B.

7B-132

551.584.61:631.344.

Boesen, Victor. **Phytotron: an all-climate greenhouse.** *Science Digest*, Chicago, 16:13-17, Nov. 1952. Condensed from *Nation's Business*, Wash., D. C., Aug. 1952. DWB—General description of the Earhart Plant Research Laboratory of the California Institute of Technology, Pasadena, where light, temperature, humidity, gas content, wind, rain and fog are under simultaneous and independent control. Some examples of the effect of changes in these factors upon various plants are given. *Subject Headings:* 1. Climatic controlled laboratories 2. Phytotron 3. Greenhouses climates.—G.T.

7B-133

551.586:612(02)

Bradtke, Franz and Liese, Walther. **Hilfsbuch für raum- und aussenklimatische Messungen für hygienische, gesundheitstechnische und arbeitsmedizinische Zwecke mit Berücksichtigung der Katathermometers.** [Manual for measuring indoor and outdoor climates for hygienic, sanitaric and industrial medical purposes, including the use of katathermometers.] 2nd rev. ed. Berlin: Springer, 1952. 108 p. 37 figs., 36 tables, refs. DLC—Ch. 5 (p. 83-94) contains general principles including legal regulations for Germany of heat requirements for dwellings, conference rooms and work rooms. In an Appendix (p. 94-97) an instrument and technique for measuring carbon dioxide content of air is described. (For fuller abstract, see item 3.11-244, Nov. 1952, MAB) *Subject Headings:* 1. Physiological climatology 2. Indoor climates 3. Handbooks 4. Germany.—G.T.

7B-134

551.584.6:631.56:633.49

Burton, W. G. **Heat production and ventilation of potatoes bulk stored in farm building.** *Agriculture*, London, 59(16):280-283, Sept. 1952. DA—Describes investigations on indoor storage of potatoes at Ditton, Eng. Heat produced by respiration raised temperature by 0.6-0.8°F per day. In an unventilated heap, temperature balance is determined by convection, and is about 1° above store air for every foot of height. If the heaps are 12 ft or more deep forced ventilation by ducts not more than 6 ft apart is desirable at 4000 c.f.m./100 tons. Protection against frost briefly considered. *Subject Headings:* 1. Potato storage 2. Storage climates.—C.E.P.B.

7B-135

551.582.3:628

Caspar, W. **Klimakarten für die Technik mit Beispielen aus dem Heizungswesen.** [Climate charts for technology with examples from heating technique.] Germany. *Deutscher Wetterdienst in der U.S.-Zone, Berichte*, No. 42:281-285, 1952. 3 figs., 3 charts, 15 refs. DWB—Paper discusses preparation of climatic data for technical use, and preparation of "technoclimatological" charts. As examples are: charts for Germany showing mean dates of beginning of heating period, mean room temperature 19°, its duration, and number of heat degree days. *(Same item as 4.9-21)*

Sept. 1953, MAB.) *Subject Headings:* 1. Temperature control 2. Degree days 3. Germany.—E.P.B.

## 7B-136

551.584.61:631.2

Cox, Earle F., *Air conditions in and near farm buildings.* *Agricultural Engineering*, St. Joseph, Mich., 33(8):495-496, Aug. 1952. 3 figs., 3 refs. DLC—Electronic equipment for measuring dry bulb and dew point temperatures, used in order to investigate micrometeorological difference between north and south sides of buildings. Practically no difference in wet bulb, average dry bulb difference 2°F, maximum difference 20°F. Air intake from the south side recommended for winter ventilation. *Subject Headings:* 1. Microclimatology of barns 2. Heating and ventilating 3. Barn climates.—A.A.

## 7B-137

551.586:697

†Crowden, G. P., *The ideal home: optimum living conditions in temperate climates.* *The Practitioner*, London, 168(1008):593-604, June 1952. 4 figs., 3 tables, 27 refs. DSG—A discussion of "the indoor climate of houses designed to enable man to live and enjoy a full life in temperate climates in spite of seasonal variations and the vagaries of the weather from day to day." The physiology of ventilation and thermal environment in an occupied room is examined and standards of ventilation, warmth and humidity in different parts of a house are tabulated. Minimum daylight standards and desirable penetration of sunlight are discussed. A useful bibliography is appended. *Subject Headings:* 1. Bioclimatology 2. Building construction.—C.E.P.B.

## 7B-138

551.584.61:656.4

Dirmhirn, Inge, *Über das Klima in den Wiener Strassenbahnwagen.* [On the climate in Vienna street cars.] *Wetter und Leben*, 4(9-10):158-162, Dec. 1952. DLC—Observations of temperature and cooling power in Feb. and Aug. 1952 in different types of street car and trailer are described. Excess of inside over free air temperature ranged from 5.4 to 10.3°C in winter and 1.6 to 2.6°C in summer, according to type of car, especially ventilation; it increased with number of passengers. There was often a strong temperature inversion inside the vehicle. The cooling power in winter varied from 9.1 to 10.1 m cal/cm<sup>2</sup>/sec inside and 14 to 16.2 on platform, compared with 25.7 in outside air. Cooling was greatest in cars with open platforms. In summer, cooling power depends on ventilation and radiation and varies greatly, but is generally small. The new American type with ventilators at head height gave greatest feeling of coolness. (Same item as 4.9-220, Sept. 1953, MAB.) *Subject Headings:* 1. Street car climates 2. Vienna, Austria.—I.L.D.

## 7B-139

551.58:69(94)

Drysdale, J. W., *Designing houses for Australian climates.* *Australia. Commonwealth Experimental Building Station, Bulletin*, No. 6, 1952. 4+42 p. 5 figs., tables, 8 refs. DLC—The physiology of body temperature is briefly discussed. Australian climates are broadly classified into hot humid, hot arid, and temperate. Climatic factors in building design are summarized with a "thermal behavior chart" (shade maximum minus indoor maximum) for different constructions. Effect of winds, and of solar radiation with various paints, materials and curtains or shades are considered. Effect of rain depends on intensity and season. Under "Functional requirements" desirable construction methods for rooms with different purposes are outlined, especially with regard to air temperature, wind, sunshine, natural lighting (including effect of obstructions), and driving rain. Orientation of buildings with regard to climate is briefly discussed. Constructional recommendations are set out for each zone. Climatic summaries are given for 7 cities. *Subject Headings:* 1. Building construction 2. Climatic effects 3. Australia.—C.E.P.B.

## 7B-140

551.584.61

Feige, R.; Koch, W.; Neumann, J. and Wittkower, W. J., *Report on the indoor climate of two apartments.* *Israel. Meteorological Service, Series A, Meteorological Notes*, No. 7, 1952. 10 p. 5 figs., 10 refs. DLC, MH-BH—Observations of effective temperature and cooling rate in late summer were made in 2 similar apartments in Tel Aviv, with external walls to S. and to E. respectively. Temperatures and effective temperatures were lower and cooling rates higher in S. than in E. room, especially with windows closed (about 1°C) but closing windows is only an advantage with nobody in the room. It is concluded that buildings with longer walls facing N. and S. give greater climatic comfort than those facing E. and W. (Same item as 4.5-207, May 1953, MAB.) *Subject Headings:* 1. Indoor climates 2. Israel.—C.E.P.B.

## 7B-141

551.5:656.6

Frankcom, C. E. N., *Meteorology in relation to the carriage of goods by sea.* *Marine Observer*, 22(156):75-81, April 1952. figs. DWB—Discusses effect of weather on conditions of cargoes,

e.g., grain. Considers sweating and ventilation in extreme cases, hygroscopic cargoes, effect of refrigeration, mechanical ventilation and drying, etc. (Same item as 3.8-21, Aug. 1952, MAB.) *Subject Headings:* 1. Marine transport 2. Moisture damage to cargoes.—C.E.P.B.

7B-142

551.584.6

Giese, Henry and Bond, T. E., *Design of a plate-type heat exchanger.* *Agricultural Engineering* 33(10):617-622, Oct. 1952. 11 figs., 3 tables, 11 refs. DLC—Heat exchanger designed to improve animal-shelter ventilation during cold winters. Tests show that barn temperature could be maintained above 50°F at -8.2°F outside and above 38°F at -20°F outside. Theory discussed and nomograms for design and operation of heat exchangers dependent on outside weather conditions (temperature, humidity) presented. (Same item as 5.10-208, Oct. 1954, MAB.) *Subject Headings:* 1. Barn climates 2. Air conditioning.—A.A.

7B-143

551.584:7

Handegord, G. O. (Ottawa) and Hutcheon, N. B. (Saskatoon), *Thermal performance of frame walls.* *Heating, Piping and Air Conditioning*, 24(3):113-118, March 1952. 10 figs., 2 refs. Summary p. 113. DWB—A preliminary study has been made of the effects of convection in insulated and uninsulated walls containing air spaces. Data are presented which illustrate the vertical variation in temperatures and heat flow rates existing in frame walls, when the insulation is ideally applied and when openings occur at the top and bottom of insulations installed to form two air spaces. *Subject Heading:* 1. Building design.—Authors' abstract.

7B-144

551.584:595.

Henson, W. R. (Agri. Dept., Canada) and Shepherd, R. F., *The effects of radiation on the habitat temperatures of the lodgepole needle miner.* *Recurraria Milleri* Busck (Gelechiidae: Lepidoptera) *Canadian Journal of Zoology*, Ottawa, 30:144-153, April 1952. fig., 4 tables, 4 refs. DLC—Also as *Canada. Dept. of Agriculture. Div. of Forest Biology. Contribution*, No. 30. The relationship between the habitat temperatures of the lodgepole needle miner and the temperature of the ambient air, radiation and cloudiness was investigated by measuring the needle mine temperatures with a copper-constantan thermocouple, the contemporaneous ambient air temperature with a sling psychrometer and the radiation with a radiation meter. At each level of radiation the mine temperatures varied with exposure, orientation of the needles to the source of radiation, color and size of cross-section of the mine and wind. The relationship between amount of mine heating and radiation is linear and regular. At any constant level of radiation, the distribution of radiation levels around a tree is regular. It was possible to predict needle mine temperatures from radiational data. On clear nights the mine temperatures fell below air temperature, but were somewhat higher on clouded nights. (Same item as 5.11-186, Nov. 1954, MAB.) *Subject Headings:* 1. Insect microclimatology 2. Lodgepole needle miner.—I.L.D.

7B-145

551.584.6:629.12.011.5

Höller, Erich, *Neue Untersuchungen zur Laderaum-Meteorologie.* [New investigations into the meteorology of ships' holds.] *Annalen der Meteorologie*, 5(7/12):281-286, 1952. Also: Macht H. G., *Meteorologisch-physikalische Grundlagen der Belüftung und Klima-Steuerung von Schiffsladeräumen.* [Meteorological-physical bases of ventilation and climatic management of ships' holds.] *Ibid.*, p. 287-292. 4 figs., 3 refs. German and English summaries p. 287. DWB, DLC—HÖLLER discusses "sweating" (condensation) as a problem of ventilation. Investigations in Germany were renewed in 1950 with examination of earlier data and observations with special instruments in holds. Discussion of biological problems is in hand. The problem is complicated but air conditioning (cargocaire) is costly. MACHT discusses theory on basis of constant rate of ventilation with inside and outside air at various temperatures and humidities, and production of heat and moisture by cargo. Accumulation of moisture in cargo itself is dangerous but can often be avoided by correctly designed ventilation. (Same item as 5.5-207, May 1954, MAB.) *Subject Headings:* 1. Ships' hold climates 2. Cargo protection.—C.E.P.B.

7B-146

551.586:531.56:633.491:551.55

Hummel, Fritz, *Mietenklima und Windeinfluss.* [Rick climate and wind influence.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 32:44-47, 1952. 9 figs. DWB—The author investigated the effects of air temperature, precipitation, snow cover and wind on potato storage bins. An optimal storage temperature of 2-4°C can be attained by exposing the storage bins in a north-south direction. The bins must be protected on the windward side during advective frost. The best practical method is the use of impregnated paper. (Same item as 4.2-258, Feb. 1953, MAB.) *Subject Headings:* 1. Rick climates 2. Potato storage 3. Wind effects 4. Germany.—A.A.

7B-147

Ito, S.; Nakausa, T. and Hata, S. (*Agric. Exper. Stat., Tokyo*), **Microclimatic studies on the vegetable culture under a shelter**. *Journal of Agricultural Meteorology*, Tokyo, 7(3/4):101-104, Nov. 1952. 2 figs., 2 tables. In Japanese; English summary p. 104. DWB—Several meteorological factors were investigated under shelters sloped 30°, 50° and 90° to the ground. No marked differences of air temperature were observed among the sheltered and control plots. The earth temperature of a plot with a 30° inclined shelter was the highest till the middle of Jan., but later a plot with a 50° sloped shelter showed the highest earth temperature. The control plot always showed lower earth temperature than the sheltered plots. The slope most appropriate to maintain the earth temperature was investigated. (Same item as 5.2-261, Feb. 1954, MAB.) *Subject Headings:* 1. Microclimatology 2. Shelter effects 3. Agricultural climatology 4. Soil temperatures.—*From authors' abstract.*

551.584

7B-148

Kern, Helmut, **Mietentemperaturmessungen auf Niedermoorboden**. [Clamp temperature measurements on low peat soil.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:186-189, 1952. 4 figs., tables, 5 refs. DWB—It is found that unventilated potato clamps on peat soil do not readily fall to correct temperatures. Clamping should be as late as possible and temperature control carried out. A "clamp climate service" is proposed for the Danube peat region. (Same item as 4.2-246, Feb. 1953, MAB.) *Subject Headings:* 1. Rick temperatures 2. Potato storage.—C.E.P.B.

551.584.6:631.6

7B-149

Kreutz, W., **Mietenklimaforschung und ihre praktische Bedeutung**. [Investigation of rick climate and its practical significance.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 32, 1952. p. 48-52. 7 figs., 2 tables. DWB—Three climatic points of view are important for the construction of ricks; 1) fast cooling and drying of the stored crops in autumn, 2) frost prevention in the winter and 3) heating prevention in the spring. Four types of ricks were tested: (I) rick on the surface in N-S direction with best ventilation, (II) a deep rick without ventilation, (III) a rick 25 cm in the soil in N-S direction, and (IV) a rick on the surface in E-W direction. Temperature variation outside, but not inside, the rick presented in graphical form. The best results are obtained with the first type of rick. (Same item as 6.3-316, March 1955, MAB.) *Subject Headings:* 1. Rick climates 2. Rick construction 3. Agricultural climatology.—A.A.

551.584.6:631.56

7B-150

Lund, C. E. (*Univ. of Minnesota, Minneapolis*), **Condensation control in buildings**. *Heating and Ventilating*, 49(8):80-84, Aug. 1952. 4 figs., 6 tables. DWB—Various factors determining the rate of condensation inside a building, such as sources of moisture, inside and outside air conditions and moisture penetration through walls, ceilings and roofs are discussed and methods of their control described. Data on moisture production by domestic operations, on saturated vapor pressure at different temperatures, on the effect of outside temperature and inside relative humidity on condensation rate within insulated walls and on vapor permeability of building materials are presented. The paper is based on research conducted at the University of Minnesota. *Subject Headings:* 1. Humidity control 2. Condensation 3. Indoor climates 4. Minnesota.—G.T.

551.574.1:551.584.61

7B-151

McClimont, W., **Moisture damage to cargoes**. *North-East Coast Institution of Engineers and Shipbuilders, Transactions*, Newcastle-upon-Tyne, 68:249-270, 1951/1952. 14 figs., 6 refs. Discussion p. D107-D120. DBS—Changes of temperature and transfer of moisture in different cargoes are discussed, and comparison with sea temperature and deck temperature along various routes illustrated by graphs. Extent of moisture damage to cargo is surveyed and notes are given on the properties, especially moisture equilibrium, of various hygroscopic cargoes. A long discussion raised numerous points. (Same item as 5.1-213, Jan. 1954, MAB.) *Subject Headings:* 1. Humidity effects 2. Ships' cargo protection 3. Ships' hold climates.—C.E.P.B.

551.571:629.123

7B-152

Mann, G., **The ventilation of farm buildings used for the storage of fruit and vegetables**. *Agriculture, London*, 59(7):335-338, Oct. 1952. 5 figs. DA—Construction of bins with free and forced ventilation is described. Forced ventilation at 4000 c.f.m./100 tons during night kept potatoes at 2°F below mean day and night temperature, compared with 4-5°F above without ventilation. *Subject Headings:* 1. Potato storage 2. Storage climates.—C.E.P.B.

551.584.6:631.56:633.491

7B-153

Metzler, Karl, **Raumklimatische Messungen und der Einfluss vom Wetter und Klima auf den arbeitenden Menschen**. [Indoor climatic measurements and the influence of weather and

551.584.61

climate on working men.] *Annalen der Meteorologie*, 5(7/12):236-241, 1952. 6 figs. Discussion p. 240-241. **DWB**. Also his: **Raumklimatische Vergleiche von Ost- und Westräumen und der Einfluss des Raumklimas auf Arbeit und Leistung**. [Comparison of climate of east and west rooms and influence of room climate on work and output.] *Angewandte Meteorologie*, 1(11):342-349, Nov. 1953. 8 figs., 9 refs. **DWB**—Comfort boundary of sultriness limit is taken as vapor pressure of 14.08 mm. Hourly means of temperature, R.H. and V.P. in two Oldenburg schools in Aug. and Sept. are shown; sultry conditions prevailed for part of day in occupied S and W rooms but not in E or unoccupied rooms. Design of new schools and best use of existing ones is discussed. (Same item as 5.6-258 and 5.6-259, June 1954, *MAB*.) *Subject Headings*: 1. Indoor climates 2. Sultriness 3. Oldenburg, Germany.—*C.E.P.B.*

7B-154

551.586:628.8

Mills, Clarence A. (*Univ. of Cincinnati*), **A year's operating results for reflective radiant conditioning. Heating, Piping and Air Conditioning**, 24(2):75-81, Feb. 1952. 4 figs., 3 tables. **DLC**—It is pointed out that "reflective radiant conditioning is based upon the use of heat reflective foil coverings on all side walls and ceilings of a building." Data obtained through recordings made in an experimental installation under varying conditions over the period of one year are presented and discussed. *Subject Heading*: 1. Air conditioning.—*G.T.*

7B-155

551.584.61

Murav'eva, G. I., **Konferentsiia molodykh nauchnykh sotrudnikov Instituta Obshchei i kommunal'noi gigieny AMN SSSR**. [Conference of junior scientific collaborators of the Institute of General and Communal Hygiene of the Academy of Medical Sciences of the U.S.S.R.] *Gigiena Sanitariia*, Moscow, No. 6:39-86, June 1952. **DLC**—Papers were presented on housing for the warm region of the U.S.S.R. and on determining the optimum microclimates of dwellings in the southern regions of the U.S.S.R., in particular in the area where the Principal Turkmen Canal is being built. Measures proposed were maximum irrigation and planting, planning houses with cross-ventilation, orientation of buildings to prevailing wind, buildings with few floors, increased height of living quarters, protection of walls against radiational heat, ventilation, etc. Names of individuals presenting papers and topics of discussion are given. (Same item as 5.5-208, May 1954, *MAB*.) *Subject Headings*: 1. Indoor climates 2. Building design 3. U.S.S.R.—*I.L.D.*

7B-156

551.584.64

Petrovič, Štefan, **Mikroklimatický prieskum ľadovej jaskyne u Dobšinej**. [Microclimatological investigation of the ice cave near Dobšina.] *Meteorologické Zprávy*, Prague, 5(4):102-106, 1952. 2 charts, 2 tables, 6 refs. **DLC**—Data on temperature and circulation conditions in the Dobšina cave (the biggest ice cave in Central Europe) are presented for 1951-1952 and compared with earlier measurements. The survey was made in connection with a deterioration in ice conditions recently noticed. It is found that the cave's climate has become more dependent on ambient temperature but with the proper care the situation can be brought under control. *Subject Headings*: 1. Cave temperatures 2. Microclimatology of caves.—*G.T.*

7B-157

551.584.61

Reidat, Rudolf (*Met. Amt Nordwestdeutschland, Hamburg*), **Wetter, Bauwesen und Heizung** [Weather, building and heating.] *Nachrichtenblatt für Technik und Wirtschaft im Hausbrand*, April 1952. [5 p.] 8 figs. Abstracted from reprint. **DWB**—The relationship of solar radiation cloudiness and wind velocity to heating of dwellings is discussed with special reference to Hamburg, Germany. The radiation ( $\text{kg cal/m}^2$ ) incident upon a south wall, east or west wall and a flat surface at 0°, 30°, 60° and 90° to the sun during the different seasons are shown graphically. The relationship between precipitation and wind direction and frequencies of wind velocities in Hamburg are shown graphically. Five year averages of the deviation from the 100-year average heating period are shown on a graph. The relationship between degree days and heating is analyzed and it is shown that not only outside air temperature but also wind is an important factor in calculating heating requirements of houses. (Same item as 5.5-209, May 1954, *MAB*.) *Subject Headings*: 1. Indoor climates 2. Solar heating 3. Hamburg, Germany.—*I.L.D.*

7B-158

551.584.61:631.344

Schubach, Karl, **Lufttemperatur und Luftfeuchtigkeits-Untersuchungen im Gewächshaus, ein Beitrag zum Gewächshausklima**. [Air temperature and humidity investigations in the greenhouse, a contribution to greenhouse climate.] *Germany. Deutscher Wetterdienst in der US-Zone Berichte*, No. 42:27-30, 1952. 2 figs., 4 tables, 3 refs. **DWB**—Observations at different points in and around a greenhouse at Giessen in summer 1947 are summarized (morning, midday and extreme clear and cloudy weather), air and soil temperature and relative humidity. (Same item as 4.9-22, Sept. 1953, *MAB*.) *Subject Heading*: 1. Greenhouse climates.—*C.E.P.B.*

7B-159

551.584.6:551.586:551.521

Seemann, J., *Strahlungsverhältnisse in Gewächshäusern*. [Radiation conditions in greenhouses.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):193-206, 1952. 3 figs., table, 10 refs. German, English, French summaries p. 193-194. DWB—This discussion of the light and heat climate of greenhouses compared with open is based on numerous records in North Rhine—Westphalia, including spectral transmission of window glass and greenhouse glass. The latter transmits more light and heat. Transmission decreases with angle of incidence, other losses are from framework (10%), artificial shading in summer (30-50%), and dirty panes (up to 10%). In winter insufficient light is transmitted. (Same item as 4.4-247, April 1953, MAB.) *Subject Heading: 1. Greenhouse temperatures.—C.E.P.B.*

7B-160

551.524:551.584.61:631.2

Seemann, J., *Temperatur und Licht unter verschiedenen Frühbeefenstern*. [Temperature and light under different hotbed panes.] *Zentralblatt für den Deutschen Erwerbsgartenbau*, Hamburg, 1(7), 1952. 2 p. 2 figs. Abstracted from reprint. GB-MO—Under wood-framed lights temperature was higher than under metal-framed lights. Clear garden glass gave the best results. Light depends only on the type of glass and the ratio glass:frame. In direct sunlight garden glass, by scattering the rays, is better than clear glass. *Subject Headings: 1. Micrometeorology of frames 2. Greenhouse temperatures.—C.E.P.B.*

7B-161

551.584.61:69

Subrahmanyam, K. and Majumdar, N. (both, *India Inst. of Hygiene and Public Health*), *A study of the effect of different wall and roof materials of buildings on indoor thermal conditions*. *Journal of Scientific and Industrial Research, Sec. A*, 11(9):402-410, Sept. 1952. 5 figs., 4 tables. DWB—Measurements made in Chittarajan, India, in seven houses of a similar design but built of different wall and roof material are reported. Construction of the houses is described and shown in diagrams. Graphical and tabulated data are presented on outside temperature, roof temperature, and wall temperature at various distances from the roof. It is found that roof material has a far more noticeable effect on indoor temperature than wall material. The coolest house in summer was one with brick walls 10 in. thick and a jack arch roof with lime concrete terracing. (Same item as 4.9-222 (Sept. 1953, MAB.)) *Subject Headings: 1. Indoor temperatures 2. Building materials 3. Building construction.—G.T.*

7B-162

551.584.61:638.2

Suzuki, S. (*Sericultural Exper. Station, Tokyo*), *Microclimate of the silkworm rearing room (Gunsan-type) for earlier stage of the worms*. *Journal of Agricultural Meteorology, Tokyo*, 7(3/4): 9-10, Nov. 1952. fig., 3 tables, ref. DWB—The microclimate of the Gun San type silkworm rearing room in which, warming with charcoal fire from the floor and watering the floor and walls, the worms of earlier stage were reared was as following: 1) As to the room temperature, a constant temperature stage was shown after a temperature rising stage of 1.5-4 hrs from the time the door was closed. The temperature difference between the places with high and low temperature was always less than 1.5°C when both pores, suction and removal, were closed, but it reached about 4°C when the pores were opened. 2) As to the room humidity, there were also two stages, a rising and a constant. The rising stage was 1-2 hrs. The humidity difference between the wet place and dry place was less than 10% when both pores, suction and removal, were closed, but it reached about 20% when the pores were opened. 3) The evaporation rate of the water was about 60-80% in a normally situated room, and was higher in a lower situated place than it was in an elevated place. 4) The concentration of CO<sub>2</sub>-gas was at least 2-4 times as much as that of normal room (in normal room CO<sub>2</sub> was 0.07-0.15%). 5) NH<sub>3</sub>-gas was 1.2-3 times that of normal room. 6) ClO<sub>2</sub>-gas and NH<sub>3</sub>-gas were almost homogeneously distributed in the room. *Subject Headings: 1. Indoor climates 2. Silkworm culture.—Author's abstract.*

7B-163

551.521.1:620.91

Teddington, England. National Physical Laboratory, *Utilization of solar energy*. *Research, London*, 5:522-529, 1952. 3 tables, 19 refs. DLC—The available energy at sea level in each latitude is tabulated for a day of average cloudiness; it will not average more than 0.1 to 0.2 kw/m<sup>2</sup>, and most heat is available in summer when it is least needed. Various methods of utilization for heating, cooking, refrigeration and power (heat engines and photovoltaic cells) are discussed. Other possibilities considered are growth of plants for fuel or for production of alcohol by fermentation, and distillation of water. It is considered that while solar energy cannot make a large contribution to power sources, small solar engines for domestic purposes are worth consideration. *Subject Headings: 1. Solar radiation 2. Solar energy utilization.—C.E.P.B.*

7B-164

551.584.61:697:636

Thompson, H. J. (*U. S. Dept. of Agri.*) and Stewart, R. E. (*Univ. of Missouri*). **Heat and moisture exchanges in dairy barns.** *Agricultural Engineering*, 33(4):201-204, 206, April 1952. 8 figs., table. 9 refs. **DA, DLC**—Report on measurement of heat and moisture and their effect on weight of dairy cattle and on milk production. The tests were made in the Psychrometric Laboratory at Columbia, Mo. The laboratory is described in detail and shown in diagrams. Tables and graphs on heat and moisture exchange and comparative data on weight and milk production of animals in the experiment chamber and those in a control chamber are presented. Ratios of total heat production to moisture production are graphically represented and the use of such graphs recommended to designers of dairy barns. *Subject Headings*: 1. Barn climates 2. Animal husbandry 3. Indoor climates.—*G.T.*

7B-165

551.584.6:612:629.13

†*U. S. School of Aviation Medicine, Randolph Field, Texas*, **Physics and medicine of the upper atmosphere: a study of the aeropause.** *Proceedings of a symposium on the physics and medicine of the upper atmosphere held at San Antonio, Texas, Nov. 6-9, 1951.* Editors, Clayton S. White and O. O. Benson, Jr. Albuquerque, Univ. of New Mexico Press, 1952. 611 p. 150 figs., tables. 46 plates, refs. at end of most chapters. **DLC**—Pertinent papers include: p. 88-98, Buettner, Konrad, **Thermal aspects of travel in the aeropause—problems of thermal radiation.** Discussion includes wall temperatures of different parts of an aircraft with black, white and aluminum surface finishes for different positions of the sun, and resulting interior temperatures. The human heat balance under conditions of space flight at different cabin temperatures is discussed. p. 171-181, Specht, H., **Toxicology of travel in the aeropause.** Gives maximum permissible concentrations of various toxic substances (mainly due to excretions from various parts of the body) for chronic human exposure, and methods for removing them. p. 567-574, Luft, Ulrich, **Physiological limitations in cabin environment and human adaptations.** Deals first with the safe minimum cabin pressure for normal individuals and for crews adapted to low pressure, breathing air or oxygen. Pure oxygen can be breathed above 15,000 ft. Tolerance limit for exposure to CO<sub>2</sub> is about 35 mm Hg. partial pressure. Time of loss of consciousness after sudden drop of cabin pressure is also discussed. Other papers deal with the effects of UV, X-ray and especially cosmic radiation, including biological effects. (*Same item as 3.11-11, Nov. 1952, MAB.*) *Subject Headings*: 1. Airplane cabin climates 2. Aviation physiology.—*C.E.P.B.*

7B-166

551.584.61:551.524

Wächtershäuser, H., **Beitrag zum Stallklima.** [Contribution to cowbarn climate.] *Germany, Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:382-384, 1952. 4 figs., 3 tables. **DWB**—Summary of records of temperature in a cowshed at Giessen compared with open. (*Same item as 4.9-223, Sept. 1953, MAB.*) *Subject Heading*: 1. Barn temperatures.—*C.E.P.B.*

7B-167

551.579.5:61

Ward, W. H., **Soil movement and weather (Section 4).** *Garston, England. Building Research Station, Note*, No. E383, July 1952. 9 p. 8 figs., 2 tables, 7 refs. Mimeo. English and French summaries. **DLC**—Vertical movements of heavy clay under rough grass due to wetting and drying amounted to 0.8 in. and extended to 3 ft deep; under bare soil only 0.2 in. and 1 ft. Near a horse chestnut tree movements were much greater, and it is recommended that buildings with shallow foundations should be at a distance from nearest trees equal to the height of the tree; for rows of trees distance should be 1½ times height. *Subject Headings*: 1. Soil moisture 2. Building construction.—*C.E.P.B.*

7B-168

551.584.61:551.524:628.13

\*Weston, E. T., **Ventilating and cooling a house with an attic exhaust fan: an account and discussion of experimental work undertaken at the Station.** *Australia. Commonwealth Experimental Building Station, Special Report*, No. 9, Aug. 1952. 31 p. 9 plates, 4 tables, 11 refs. **DWB**—A study of the effect of an attic fan upon the thermal performance of a timber-frame house and a ¼ scale model of it adjusted to be similar to that of brick construction. Under conditions of "calm" and light breeze and moderate to rapid rates of fall of outdoor temperature, the fan reduced indoor air temperature and diminished discomfort by increasing air movement. The reduction of indoor temperature at night was generally greatest under hot conditions and least following relatively cool days. Attic fans can be used to greatest advantage in inland regions of Australia where diurnal temperature variations are relatively large and night breezes are infrequent. Data on indoor temperatures in the experimental studies are given in tables and graphs showing rate of temperature fall for various forms of ventilation and rate of fall of indoor temperature in relation to outside rate of fall. Rates of air movement with various rates of change of air volume etc. are presented. *Subject Headings*: 1. Indoor temperatures 2. Air conditioning 3. Attic fans.—*I.L.D.*

7B-169

551.584.61:637

Witzel, S. A. and Derber, D. W., *Engineering phases of dairy barn research, 1941-1951. Agricultural Engineering*, 33(10):635-642, Oct. 1952. 5 figs., 11 refs. DA, DLC—Temperature and humidity inside of test barns (10 year (winter) averages) compared with average outside weather conditions. *Subject Heading: 1. Barn climates.—A.A.*

7B-170

551.584.61

Woolrich, W. R. (*Univ. of Texas*). *Warm climate livability of six Texas houses. Heating and Ventilating*, 49(5):73-78, May 1952. 9 figs. DWB—An investigation of living conditions in six houses of different construction and in different surroundings was started in Austin, Texas, by Acme Brick Co. and the Univ. of Texas. The climate of the region is described. Theoretical and experimental data of air flow and temperature are presented in graphical form for the houses investigated under varying conditions, such as open or closed windows, use of fans, roof spray, etc. (*Same item as 4.2-249, Feb. 1953, MAB.*) *Subject Headings: 1. Indoor climates 2. Austin, Texas.*  
—G.T.

7B-171

551.584.61:638.2

Yokoo, T.; Oomori, F.; Tabata, S. and Hattori, T. (*Fukuoka District, Central Met. Obs.*). *On the microclimate in the silkworm-rearing house. Journal of Agricultural Meteorology*, 7(3/4): 105-107, Nov. 1952. 2 figs., table. DWB—The temperature of the silkworm-rearing room was observed with thermo-junction at Fukuoka Sericul-Experiment Station during May 11-12, 1951. The stage of silkworm in the room was third casting (sleeping) period. Observed points are distributed at every meter from east to west, south to north, and floor to ceiling. East and west side walls of the room were boarded with timber planks adjoining the corridor. There was a fireplace in the middle of the floor and an opening in the middle of the ceiling of the room. Maps are presented for vertical and horizontal mean daily temperature distribution. *Subject Headings: 1. Indoor climates 2. Silkworm culture.—From authors' abstract.*

## 1953

7B-172

551.58:72

†Aronin, J. E., *Climate and architecture. Progressive architecture book.* New York, Reinhold, 1953. 304 p. 287 figs., 57 tables, numerous refs. DLC—An elementary account of almost every aspect of climate as it affects the work of the architect. Includes insulation and planting of shade trees, wind effects and airflow through and around buildings, shelter belts, snow fences, etc. Illustrations mainly American. Abstracted from review. (*Same item as 5.9-1, Sept. 1954, MAB.*) *Subject Headings: 1. Climatic effects 2. Architecture.—C.E.P.B.*

7B-173

697.9:551.521.1

Dornberger, Werner W., *Devices against the sun. National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:163-169, 1953. 12 figs. DWB—Slides were shown illustrating external attachments to buildings to reduce solar heat gains. They are classified into horizontal (high sun, south face), vertical (west face), egg-crate (SW, SE) and movable. A number of recommendations are made. *Subject Headings: 1. Building construction 2. Antisolar devices.*

7B-174

697.9

Drysdale, J. W., *Heat capacity and the distribution of mass in the design of buildings for hot climates. National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:121-125, 1953. refs. DWB—The mechanism of heat flow through the outer walls of a building heated by high dry-bulb temperature and solar radiation is discussed. Heat will commence to flow through an uninsulated timber-frame construction 6-8 hrs earlier than through 11-in. brick cavity walls, but the roofs may have only a 1-hr delay. Natural ventilation and a large diurnal range of temperature modify this lag. High heat capacity is an advantage by day but a disadvantage at night, but weight per cubic meter of house volume also depends on nature of climate (hot-dry or hot-humid). Construction should be such as to minimize chance of indoor temperature exceeding 85°F. *Subject Headings: 1. Building construction 2. Hot climates.—C.E.P.B.*

7B-175

551.584.61:551.524:69

Drysdale, J. W., *Summer temperatures in buildings: a review of experimental work from 1950 to 1953, summarizing investigations conducted by R. M. Griffith (1950-1951) and L. G. Alexander (1951-1952) and by the author during the 1952-53 summer. Australia. Commonwealth Experi-*

*mental Building Station, Special Report*, No. 11, March 1953. 26 p. 5 figs., 6 tables, refs. **DWB**—Investigations made in Australia indicate that insulation and (white) paint reflection on frame buildings in the hot dry climate of the interior is not effective in reducing daytime temperatures indoors unless natural ventilation is avoided. Effects of various types of roofing, brick walls, dead air spaces, cement floors and other types of construction are also evaluated. Radiation from the ceiling or roof was also considered in its quantitative relationship to air temperature in houses and factories. *Subject Headings*: 1. Indoor temperatures 2. Building construction 3. Australia. **I. Griffith, R. M. II. Alexander, L. G.—M.R.**

7B-176

551.586:359.0

†Ellis, F. P., *Tolerable and desirable levels of warmth in warm climates, with special reference to the requirements of men in the Royal Navy.* *Royal College of Surgeons, of England, Annals*, 13:369-391, 1953. 6 figs., 4 tables, 50 refs. **DSG**—The average thermal environment (effective temperature, dry and wet bulb, air speed and radiant warmth) was measured in various parts of naval ships in eastern waters. Upper tolerable levels of wet bulb temperature for acclimatized fit men at work were tested in London and Singapore. The numbers incapacitated are plotted against dry bulb temperature and vapor pressure. Effect of drinking water and taking in salt is examined. Comparisons are made between comfort of European and Asian men and women at different dry and wet-bulb temperatures. Finally a nomogram is reproduced showing comfort zones in different parts of the world at different seasons. Upper tolerable effective temperatures are also tabulated for different air speeds. (*Same item as 6.4-317, April 1955, MAB.*) *Subject Headings*: 1. Bioclimatology of ships 2. Ship microclimatology.—**C.E.P.B.**

7B-177

697.9:551.573

Farr, R. S., *Adiabatic cooling.* *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:141-148, 1953. 7 figs. **DWB**—Adiabatic cooling is cooling by evaporation. The working and load calculation of an evaporative cooling system are described with psychrometric charts and specimen calculations. Controls, maintenance problems and economics are discussed. *Subject Headings*: 1. Cooling methods 2. Evaporative cooling.—**C.E.P.B.**

7B-178

551.584.61

Kitamura, K., *Meteorological conditions in the "Shōsōin" Treasure House.* *Journal of Meteorological Research*, Tokyo, 4(9):705-710, Feb. 1953. 6 tables. In Japanese; English summary, p. (43)-(44). **MH-BH**—Data on indoor temperature and humidity are tabulated and compared with outdoor values (Dec. 1949-April 1950). (*Same item as 5.10-209, Oct. 1954, MAB.*) *Subject Headings*: 1. Indoor climates.—**G.T.**

7B-179

551.584.61

Kosmodamianskaia, D. M., *Mikroklimat sel'skikh zhilishch iz mestnogo ognestol'kogo materiala v usloviakh Zavolz'ia.* [Microclimate of rural houses made of fire-resistant material in the Trans-Volga region.] *Gigiena i Sanitariia*, Moscow, No. 7:13-17, 1953. ref. **DLC**—The houses were constructed of sandstone blocks, floors were wooden and roofs were of deal planks. Relative humidity was measured at 0.15 and 1.5 m above the floor and temperature at 1.5 m above the floor thrice daily. Also skin temperatures were measured. Data are given on the variation of the meteorological variables during the summer and winter for 11 days, their relationship to outdoor temperature and the comfort sensations of the inhabitants. (*Same item as 5.8-245, Aug. 1954, MAB.*) *Subject Headings*: 1. Indoor climates 2. Microclimatology 3. Trans-Volga Region. **U.S.S.R.—I.L.D.**

7B-180

551.584.61

Lerner, P. M., *K voprosu gigenicheskogo obosnovaniia proektirovaniia zhilishch v zharkom klimaticheskoi raione SSSR.* [The problem of planning housing in hot climatic regions of U.S.S.R. on hygienic principles.] *Gigiena i Sanitariia*, Moscow, No. 8:26-30, Aug. 1953. 2 figs. **DLC**—This article is a brief summary of research on housing climatology carried on during 1949-52 in Central Asia under the auspices of the Academy of Medical Sciences of the USSR. Data are presented showing that eastern and western exposure of windows do not differ on their effect upon room temperature but with southern exposures the room temperatures are less than in the former two exposures. Humidity is independent of exposure by day. Comfort sensations were investigated for various hours of the day for different exposures. The relationship between wall thickness and room temperature and the relationship between number and the variation of room temperature with height above the ground were investigated. Graphs show daily march of air temperature (June-July-Aug. 1950) and isopleths of walls of a building in Samarkand oriented to the west. *Subject Headings*: 1. Indoor climates 2. Building design 3. Central Asia.—**I.L.D.**

7B-181

551.586:628.8

†Leusden, F. Pels and Freymark, H., *Die Raumklimauntersuchung in der einfachen praktischen Anwendung an Hand von Beispielen*. [Investigation of room climate in simple practical application with examples.] *Naturwissenschaftliche Rundschau*, Stuttgart, 6(2):57-60, Feb. 1953. 4 figs., 28 refs. DWB—Summary of literature. Important factors are temperature, humidity, air movement and number of occupants. Diagrams are drawn for good, moderate and bad conditions of temperature and R.H. for sitting persons for air movement below 0.2 and 0.2-0.3 m/s. Mapping of comfort of a room is described. (Same item as 4.7-203, July 1953, MAB.) *Subject Headings*: 1. Air conditioning 2. Comfort climate.—C.E.P.B.

7B-182

551.584.61:615.8

Levina, A. I. and Ivannikova, T. F., *Meteorologicheskie usloviia v rabochikh pomescheniakh ekskavatorov dlia srednei polosy SSSR*. [Meteorological conditions in worker's premises on excavating projects in Central U.S.S.R.] *Gigiena i Sanitariia*, Moscow, No. 6:14-16, June 1953. DLC—The meteorological conditions, namely air temperature and movement and relative humidity within the work cabin and the machine shop of excavating projects are described. The air temperature difference between interior and outside air varied with the excavations and did not exceed the official standards during the warm season. The relative humidity of the air varied between 32-65% while the outdoor relative humidity ranged between 36 and 76%; the air movement near the work stands ranged between 0.1 and 0.5 m./sec. The warmth sensations of the machinists and their helpers were different for the same air temperatures because of varying exposure to uncomfortable conditions. Methods of increasing comfort especially by means of air movement at place of work are suggested. (Same item as 5.8-246, Aug. 1954, MAB.) *Subject Headings*: 1. Indoor climates 2. Comfort climate 3. Central U.S.S.R.—I.L.D.

7B-183

551.584.61:551.524

Makjanič, B., *O temperaturnim prilikama u sobi*. [Features of room temperature.] *Yugoslavija. Hidrometeorološka Služba, Vesnik*, 2(1):17-20, Jan./March 1953. 2 figs. DWB—Data obtained in a single series of temperature measurements in the author's room are presented. The effects of vertical temperature distribution in the room on the different comfort of children and adults and on the accuracy of readings of mercury barometers are discussed. The influence of various factors, such as orientation of the room and air circulation within the room, upon horizontal and vertical temperature distribution is considered. (Same item as 5.8-247, Aug. 1954, MAB.) *Subject Heading*: 1. Indoor temperatures.—G.T.

7B-184

728:551.524.36

Mayer, Albert. *Architectural design for hot climates*. Introduction to subject. *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:32-37, 1953. DWB—A general statement of the problem of designing houses of moderate cost for different types of hot climate. The importance of verandas for sleeping, and of studying local practices, is emphasized. Cooling by evaporation ("desert coolers"), ventilation, and protection from reflected solar radiation, including roofs and glare are discussed. A number of suggestions are put up for consideration. *Subject Headings*: 1. Building design 2. Hot climates.—C.E.P.B.

7B-185

697.9:551.5

†National Research Council, Wash., D. C. Building Research Advisory Board, *Housing and building in hot-humid and hot-dry climates*, Nov. 18-19, 1952, Proceedings. Its *BRAB Research Conference Report*, No. 5, May 1953. 177 p. numerous figs., tables, refs. Bibliog. p. 174-177. DWB—The conference was divided into four sessions of papers followed by panel discussions. The papers are abstracted separately, references are given below to abstracts already included in MAB. Pt. 1. Living in hot environments: WALKER, RALPH, *Practical aspects of tropical living* (same item as 5.5-214, May 1954, MAB); LEE, DOUGLAS H. K., *Significance of hot environments for man* (same item as 5.5-216, May 1954, MAB.); OLGAY, VICTOR, *Bioclimatic approach to architecture* (same item as 5.9-9, Sept. 1954, MAB.). Pt. 2. Building in hot environments. Session 2. Architectural design for hot climates: MAYER, ALBERT, *Introduction to subject*. OLGAY, ALADAR, *Solar control and orientation to meet bioclimatical requirements* (same item as 5.3-302, March 1954, MAB.); REED, ROBERT H., *Design for natural ventilation in hot-humid weather*; DEERING, ROBERT B., *Technology of the cooling effect of trees and shrubs* (same item as 5.3-293, March 1954, MAB.); ATKINSON, G. ANTHONY, *Building in warm climates* (same item as 5.3-277, March 1954, MAB). Session 3, Structures and materials in hot climates: DAWSON, R. F., *The design of building footings on expansive clay soils* (7B-261); THOMPSON, J. NEILS, *A study of structural features in masonry houses*; (7B-261); HOLMES, B. M., *Deterioration problems of materials and structures in hot climates* (5.9-24, Sept. 1954, MAB.); RAPP, GEORGE M., *Performance and properties of materials*

in hot climates (same item as 5.3-131, March 1954, MAB.); DRYSDALE, J. W., **Heat capacity and the distribution of mass in the design of buildings for hot climates** (same item as 7B-174, Feb. 1956, MAB.). Session 4. Mechanical problems in hot climates: WOOLRICH, W. R., **The economics of livability cooling and heating in hot climates**; SUTTON, GEORGE E., **Roof spray** (same item as 7B-194, Feb. 1956, MAB.); FARR, R. S., **Adiabatic cooling** (same item as 7B-177, Feb. 1956, MAB.); URDAHL, THOMAS H., **Dehumidification** (same item as 7B-197, Feb. 1956, MAB.). The meeting closed with a Conference Summary by WILLIAM A. SCHEICK (p. 161-162). DORNBERGER, WERNER W., gave an evening demonstration of **Devices against the sun** (same item as 7B-173, Feb. 1956, MAB.). *Subject Headings: 1. Building construction 2. Hot climates.—C.E.P.B.*

7B-186

551.586:72:016

†National Research Council, Wash., D. C. Building Research Advisory Board, **Preliminary BRAB Bibliography of housing and building in hot-humid and hot-dry climates**. Cover-title: BRAB, May 1953, **Tropical Housing Bibliography**. 32 p. Also its: **Preliminary bibliography of housing and building in hot-humid and hot-dry climates**. 1953 Supplement (Oct. 1952-Dec. 1953). *Texas. Univ. Bureau of Engineering Research, Special Publication*, No. 27, 1954(?) 115 p. DWB—The purpose of these bibliographies is to provide climatic, physiological, architectural, construction and other technical data for building efficient and comfortable dwellings in hot-humid and hot-dry climates. The items are classified into seven sections: climatology and physiology; architecture; structure and structural components, soils and foundations; building materials; construction methods; air conditioning and ventilation; and housing and building. The items in each section are further subdivided into several categories and are arranged geographically. (The first title is the same as 6B-163, Feb. 1955, MAB.) *Subject Headings: 1. Bioclimatology 2. Building climatology 3. Tropical climatology 4. Tropical housing bibliographies. I. Texas. Univ. Bureau of Engineering Research.—I.L.D.*

7B-187

651.524:551.584.61:697

\*Neumann, H.; Peleg, M. and Robinson, N., **Research on indoor climate: thermal measurements on objects in the Jordan Valley**. Haifa. Hebrew Institute of Technology. Station for Technical Climatology, *Bulletin*, No. 4, 1953. 24 p. 13 figs., table, refs. DWB—Measurements were made in Maos-Haim, situated in a depression 835 ft below sea level. Specially constructed insulated walls 32 in. square were built of various materials, facing north, south, east and west. Variations were made in thicknesses of walls, structure, outside color, plasters, shadowing walls, and orientation of walls. Temperatures were measured on the inner surface of the walls, thermally insulated from the inner space. Each factor influencing the resulting temperature is considered, and the principal results are summarized. (Same item as 5.8-248, Aug. 1954, MAB.) *Subject Headings: 1. Indoor temperatures 2. Heating and ventilating 3. Maos-Haim, Israel.—C.E.P.B.*

7B-188

551.586:551.501:581.1

Nitsch, J. P., **Un laboratoire de bioclimatologie: Le Phytotron**. [Laboratory of bioclimatology: The Phytotron.] *La Nature*, Paris, No. 3221:272-278, Sept. 1953. photos, graphs. DLC—The use of the Phytotron in studying the relation of environmental (climatic) factors to plant growth is discussed at length and illustrated with photographs of plants studied, and graphs showing night temperature or mean temperature relationships to growth of such plants as tomatoes of different varieties, pimentos, beets, etc. The Phytotron consists of two chambers—one with artificial illumination and one with solar radiation. Control of all elements is possible. Use of the Phytotron at Pasadena is described. *Subject Headings: 1. Phytotron 2. Climatic controlled laboratories 3. Greenhouse climates.—M.R.*

7B-189

551.584.61

\*Ōta, Iwao, **Some observations of microclimate in glass-room**. Tokyo. Forest Experiment Station, *Bulletin*, No. 59:85-98, March 1953. graphs, diagr., photo. In Japanese; English summary p. 98. DWB—Comparative data are presented for the microclimate in a glass room and in the field. The data were obtained for 12 months starting Feb. 1951. The microclimates in the glass room differed from those in the field according to opening conditions of windows and doors and according to weather conditions. Each location within the room showed different microclimatic conditions. Control of opening conditions and proper adjustment of the arrangement of plants is recommended. (Same item as 5.1-280, Jan. 1954, MAB.) *Subject Headings: 1. Greenhouse climates 2. Indoor temperatures.—Author's abstract.*

7B-190

551.584.65

\*Polli, Silvio, **Meteorologia ipogea nella grotta gigante presso Trieste**. [Cave meteorology of the Giant Grotto near Trieste.] Trieste. Istituto Talassografico, *Pubblicazioni*, No. 300, 1953. 11 p. 2 tables, diagr. DWB—The cave whose average and extreme temperature and humidity

conditions are tabulated and discussed in this paper, occupies a space 200 m in length, 60 m in width and 115 m in depth. It communicates with the exterior by two small apertures. According to the temperature and humidity data presented (1951-1954), the lower portion of the cave is characterized by conditions of considerable stability. A special feature of the cave's meteorology is the fact that outside pressure variations produce measurable inward or outward air currents at the apertures. A pressure change of the order of 0.01 mb, for example, will produce air currents of a few cm/sec. **Subject Headings:** 1. Cave temperatures 2. Cave micrometeorology 3. Humidity in caves.—G.T.

7B-191

551.586:636.4

Sainsbury, D. W. B., **The ventilation and thermal insulation of piggeries.** *Agriculture*, London, 60(5):210-217, Aug. 1953. 6 figs. DA—Investigations in over 30 piggeries have shown great importance of environment on health and productivity of livestock. Heat transmission of walls of various constructions, roofs and floor show that by careful selection of materials, heat loss in winter can be greatly reduced. Construction must be airtight except for ventilators, which should give an air speed of 30-40 ft/min. Suitable design and placing of air inlets and outlets is illustrated. **Subject Headings:** 1. Bioclimatology 2. Shed microclimatology.—C.E.P.B.

7B-192

551.594.13:551.584.61 551.574.1

Schilling, Gerhard F. and Carson, Joan, **On the electrical conductivity of air inside buildings.** *California. University at Los Angeles. Institute of Geophysics*, Publ. No. 25. Also published in: *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, 5(1):52-58, 1953. fig., 20 refs. English, German and French summaries p. 52-53. Also: Hess, V. P., **On the electrical conductivity and the nucleus content of air inside buildings.** *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, 7:262-265, 1954. 2 refs. English, German and French summaries p. 262-263. MH-BH—Measurements of conductivity were made in a residential part of Los Angeles, with two identical Gerding tubes recording direct current continuously, one in an office room (windows closed) and one on the flat roof above. The results, inside and outside, were similar. Occupancy of the room had little effect. (Same item as 5.2-301, Feb. 1954, MAB.) In the critical note by Hess, sudden increases in conductivity are attributed to faults in the apparatus. (Same item as 6.1-343, Jan. 1955, MAB.) **Subject Headings:** 1. Electrical conductivity of air 2. Indoor climates.—C.E.P.B.

7B-193

551.521.16:728

Schulze, Rudolf, **Licht und Wohnung—Strahlungsgenuss geneigter Flächen.** [Light and housing—radiation on inclined surfaces.] *Annalen der Meteorologie, Medizin-Meteorologische Hefte*, No. 8:126-140, 1953. 17 figs., table, 9 refs. DWB—This useful paper discusses in detail measurements of radiation and illumination through windows and on vertical and inclined surfaces on different aspect. "Daylight quotient" (illumination ratio, room/open) is examined for windows of different shapes and slopes. Daily records of sun+sky radiation on external surfaces are shown as ratios to horizontal surface and spectral distribution (clear and cloudy days) illustrated. Quality of light in living rooms is discussed, including important effects of colors of walls, floor and ceiling. (Same item as 4.11-141, Nov. 1953, MAB.) **Subject Headings:** 1. Daylight illumination 2. Building design.—C.E.P.B.

7B-194

697.9:551.573

Sutton, Geroge E., **Roof spray.** *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:137-140, 1953. 5 figs. DWB—Two lawn sprays were set up on a flat asphalt roof (area 2400 sq ft) in Florida with thermostatic control at roof temperatures of 95, 100 and 105°F. Operation was efficient at 100°F, maintaining a ceiling temperature of 90°F compared with over 100°F with an unsprayed roof. Cost was less than half that of mechanical refrigeration, and may serve as a useful auxiliary to the latter. **Subject Headings:** 1. Cooling methods 2. Evaporative cooling.—C.E.P.B.

7B-195

551.584.61:69

Texas, Univ. Bureau of Engineering Research, **Research on livability in warm climates: research reports, Nos. 1-7.** No. 1 Long, Wayne E., **Acme Ceramic Housing Project.** [4 p.] photos, diag. [n.d.] No. 2 Woolrich, W. R., **Observations on heating and cooling the individual.** [4 p.] [n.d.] No. 3 Woolrich, W. R., **Regionalized heating and ventilation research.** [6 p.] 8 figs. [n.d.] No. 4 Dawson, Raymond F., **Vertical movement of a ceramic house.** [3 p.] 8 figs. Aug. 31, 1951. No. 5 Long, Wayne E., **Thermal characteristics of ceramic walls.** [3 p.] 2 figs., Sept. 14, 1951. No. 6 Long, Wayne E., **Thermal properties of masonry and frame houses.** [3 p.] figs. Sept. 28, 1951. No. 7 Bacon, R. A., **Cooling effect of a roof spray on a ceramic house.** [7 p.] 9 figs. Jan. 1953. DWB—This review of papers is connected with the human comfort characteristics, thermal properties and quality of ceramic houses constructed in Austin, Texas. The papers

of W. R. WOOLRICH are concerned primarily with providing thermal comfort in the southwest part of the United States. He discusses the heat balance of human beings, the effect of an impervious wall upon thermal exchange, the effect of admitting air inside the house at or soon after sundown in the southwest and the types of walls suitable for houses in that region in order to make them livable during the summer and outlines the type of area research on cooling and ventilating of housing that should be carried on in the south and southwest. Also the research of night ventilating of various types of housing with cool air is analyzed and the indoor temperature variations are shown graphically. *Subject Headings:* 1. Indoor climates 2. Building design 3. Comfort climate 4. Physiological climatology 5. Southwest United States 6. Texas. I. Acme Brick Co., Fort Worth, Texas II. Coates Co., Austin, Texas III. Clay Products Association of the Southwest, Austin, Texas.—I.L.D.

7B-196

551.584.6:631.2

Uehara, M. and Isozaki, Y., *On the micrometeorology in the hot-cap, Pt. 1.* *Journal of Agricultural Meteorology*, Tokyo, 8(1-2):4-6, March 1953. 2 figs., 3 tables. In Japanese; English summary p. 6. DWB—Hourly observations of solar radiation, temperature distribution and evaporation were made from April 21 to May 11, 1952, in the open air and in frames of vinyl, cellophane, paraffin, glass and oil paper. Although the loss of radiation was least under cellophane, temperature tended to be higher under vinyl. Evaporation was least under vinyl and greatest under cellophane, but much less than in the open. *Subject Heading:* 1. Micrometeorology of frames.—C.E.P.B.

7B-197

697.9:551.571

Urdahl, Thomas H., *Dehumidification.* *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:149-155, 1953. 10 figs., 3 refs. DWB—The importance of dehumidification for comfort and for avoiding deterioration of materials is emphasized. It is generally neglected because it is less obvious than cooling and requires more energy. A combined water heating, refrigeration and dehumidifying unit is described. Diagrams show temperature and humidity danger zones for metals, wood, textiles, flour, etc. in storage. *Subject Headings:* 1. Dehumidification 2. Storage microclimatology.—C.E.P.B.

7B-198

551.584.61:72

Vetoshkin, S. I., *Gigienicheskie voprosy proektirovaniia zhilishchnogo stroitel'stva v zharkom klimaticheskom raione.* [Hygienic problems in planning dwellings in a warm climate.] *Gigiena i Sanitariia*, Moscow, No. 11:10-16, Nov. 1953. DLC—The effect of houses with various room heights, wall thickness, orientation, etc. upon the heat balance of individuals in a hot, dry climate was investigated in the Turkmen, S.S.R. Data are given on the heights of rooms, thickness of walls, interior temperature and on physiological responses of experimental subjects. *Subject Headings:* 1. Indoor climates 2. Arid zones 3. Building design 4. Turkmen, S.S.R.—I.L.D.

7B-199

631.56:633.491

Wächtershäuser, H., *Milder Herbst und zu warme Mieten.* [Mild autumn and too warm stacks.] *Germany. Deutscher Wetterdienst, Wetterkarte*, No. 358, Dec. 24, 1953. fig. DWB—An experimental stack covered with straw kept down by scattered earth was built alongside a normal stack covered by 5-10 cm earth over straw. In the warm autumn the former smoothed out the temperature variations of the free air, while the latter maintained a constant temperature at too high a level. Times of broadcast "stack advice" are notified. *Subject Headings:* 1. Potato storage 2. Rick climates.

7B-200

697.9

Woolrich, Dean W. R., *The economics of livability cooling and heating in hot climates.* *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report*, No. 5:132-136, 1953. DWB—Now that tropical diseases and wild animals are under control, hot regions are livable for whites, but houses must be designed for cooling instead of heating. A number of suggestions are made for relatively inexpensive cooling in hot-humid and hot-dry climates (fans, machine cooling, evaporative cooling). Such heating equipment as is required for the short cold periods should be even more inexpensive. *Subject Heading:* 1. Cooling methods.—C.E.P.B.

1954

7B-201

551.508.8:551.584.6

Baumbach, S., *Schwingungsunempfindlicher Schiffsvielfachsreiber zur Untersuchung des Schiffsladeraum- und Seeklimas, Messmethode und Messelemente.* [Oscillation-sensitive ship polygraph for investigating hold and sea climate, measuring technique and measuring units.]

Germany. *Deutscher Wetterdienst. Instrumentenamt Nord, Hamburg, Technische Mitteilungen des Instrumentenwesens*, No. 28:3-11, Oct. 1954. 5 figs., 7 refs. **DWB**—The "sweep-balance-method" developed by G. KEINATH and known as the Keinath Recorder is applied to the simultaneous recording of individual meteorological elements under conditions of considerable vibration. The measuring principle involves a paper strip over which a pen moves perpendicularly and maintains slide contact with a potentiometer, connected with a Wheatstone bridge into which various elements are inserted. The design and construction of the instrument including the wiring, the recording devices, the temperature elements and the humidity or dew point element are described and the reading errors are discussed. *Subject Headings: 1. Keinath recorder 2. Ships' hold climates 3. Recording equipment sensitivity.—I.L.D.*

7B-202

551.5:629.123.4

Brown, P. R., **Cargo ventilation**. *Marine Observer*, 24(164):97-102, April 1954. 3 figs. **DLC**—Analysis of problems of maintaining suitable temperatures in uninsulated cargo spaces in ships against solar radiation and heat transferred from engine room, surrounding air and water and air brought in by ventilation. Rules are formulated for making use of dew point with dry and hygroscopic cargoes. Experiences on a new liner MV "Cedric" with forced ventilation are described, including diurnal variation of relative humidity. (Same item as 5J-105, Oct. 1954, *MAB.*) *Subject Headings: 1. Cargo ventilation 2. Ship's hold climates.—C.E.P.B.*

7B-203

551.524.36:697

\*Burdick, Glydewell (Wis. Power and Light Co., Madison), **Heat pump utilizes heat storage**. *Electrical World*, N. Y., 142(20):132-134, 220, Nov. 15, 1954. 3 tables. **DWB**—Analysis of performance records vs degree days during periods of 7 to 15 days from Oct. 1953 to April 30, 1954 in a home near Madison, Wis. Results on coldest day (Jan. 17, 1954) also tabulated. Performance was considered satisfactory, with temperature kept at 75°F throughout the period. *Subject Headings: 1. Heat pumps 2. Degree-day data 3. Madison, Wis.—M.R.*

7B-204

551.584.61:625.24

Cagliolo, Alberto, **Marcado gradiente térmico en vagones de ferrocarril**. [Marked thermal gradient in freight cars.] *Meteoros*, Buenos Aires, 4(4):395-398, Oct./Dec. 1954. 2 figs. **DWB**—The thermal conditions prevailing during the summer in freight cars were studied in different types of cars. Graphs showing the daily maximum and minimum temperatures are presented. (Same item as 6.8-314, Aug. 1955, *MAB.*) *Subject Headings: 1. Thermal gradient 2. Freight car temperatures.—I.L.D.*

7B-205

628.9

Garston, England. Building Research Station, **Some general principles of the lighting of buildings**. Its *Digest*, No. 70, Oct. 1954. 8 p. 3 figs., 3 tables. **DLC**—The Illuminating Engineering Society of Great Britain standards of illumination for various purposes are set out in lumens per sq ft and as percentage of outdoor illuminations. Principles of local lighting are described, including avoidance of glare discomfort or dull uniformity. *Subject Heading: 1. Building illumination.—C.E.P.B.*

7B-206

551.586:631.5

\*Gentili, J., **Climate and comfort at home**. *Wesfarmers News*, West Australia, Supplement, Sept. 2, 1954. 20 p. 25 figs., 24 tables, 24 refs. **GB-MO**—Wail-building materials in the different Australian states are surveyed and their suitability in hot climates discussed. The incidence of solar radiation in 32½°S on slopes and on walls and pitch roofs facing in different directions is examined, taking into account also hot and cool winds and storms. Absorption and reflection of light and heat by paint of different colors and other materials is set out. Author next considers the space immediately below the roof, and the underlying ceiling, with characteristics of different insulating materials. Next the effect of construction and material on heat transmission through walls facing in different directions is taken up, the probable indoor temperature when outdoor shade temperature is 100°F and 110°F being estimated. Effect of internal walls and partitions is discussed. Finally, the placing and size of windows to give best light and ventilation is considered. The memoir contains a great amount of useful data in tables and diagrams. *Subject Headings: 1. Comfort climate 2. Building design.—C.E.P.B.*

7B-207

551.510.4:551.586:551.588.7

Georgii, Hans-Walter, **Untersuchung über den Luftaustausch zwischen Wohnräumen und Aussenluft**. [Investigation of the exchange of air between occupied rooms and outer air.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 5(2):191-214, 1954. 7 figs., 4 tables, 17 refs. German, English and French summaries p. 191. **DLC**—After summarizing literature, author describes investigations in a second story room in Frankfurt a.M. (2 outside brick walls, wood floor).

CO<sub>2</sub> and aerosols (CaCl<sub>2</sub>) were introduced and rate of decrease measured. Volume of air exchanged shown by CO<sub>2</sub> increased with wind velocity ( $a+bV^2$ ) from 2½ ltr/s with calm air to 10 with wind 7 m/s, that shown by aerosol from 0.5 to 6; difference due to ventilation through wall pores (CO<sub>2</sub> only) and cracks (both). Wind direction had little effect. A similar room with linoleum floor had much smaller exchange coefficient. No connection was found with indoor-outdoor temperature difference but in a cellar exchange coefficient increased linearly with temperature difference. (Same item as 5.9-94, Sept. 1954, MAB.) *Subject Heading: 1. Ventilation of rooms.—C.E.P.B.*

7B-208

551.586:628.8

Gormosov, M. S. and Tsiper, N. A., **K voprosu o dopustimnykh predelakh iskusstvennogo okhlazhdeniia zhilykh pomeshchenii v letnii period.** [Permissible limits for artificial cooling of living quarters during summer period.] *Gigiena i Santariia*, No. 7:8-14, July 1954. 3 figs., table. **DLC**—A study of the physiological reactions of the human body, namely variations of: skin and body temperatures, infrared emanation from the skin surface, sweating, blood pressure, pulse and respiration, loss of skin moisture, vascular reaction to local chilling irritation, etc. during the passage from hot outdoor temperature into cooled quarters and vice-versa in order to determine the most salutary temperature—were conducted in a microclimatic chamber of the State Medical Institute and a railroad car on the Tashkent-Krasnovodsk line. After having discussed the results of the experiments made on a test group of 27 individuals (22 to 55 years of age), authors come to the conclusion that with an outdoor temperature of 34-35°C the most favorable air conditioned temperature is 23-24°C, with a relative humidity of 45-50% and an air movement of 0.15-0.20 m/sec. *Subject Heading: 1. Air conditioning.—A.M.P.*

7B-209

551.521.16:72

Hopkinson, R. G. and Longmore, J., **A study of the interreflection of daylight using model rooms and artificial skies.** *Garston, England. Building Research Station, National Building Studies Research Paper*, No. 24, 1954. 24 p. 10 figs., photo, 5 tables, 18 refs. **GB-MO**—To measure the indirect lighting in hospitals and schools, three model rooms were constructed, with lighting resembling that of an overcast sky. A number of photocell measurements were taken with walls of different colors and different floors. The logarithm of the daylight factor was found to be proportional to the reflection factor of the walls. A slide-rule was devised to facilitate calculation of daylight factor. Tests on actual buildings showed that this is sufficiently accurate, and that the indirect component of lighting is often much larger than the direct component. *Subject Headings: 1. Daylight illumination 2. Building design.—C.E.P.B.*

7B-210

551.584.61

Kanaseki, Shiro and Miyagawa, Ipei, **Micrometeorology in the frame**, pt. 1-2. *Journal of Agricultural Meteorology*, Tokyo, 9(3/4):107-111, Aug. 1954. 7 figs., 4 tables, 13 refs. In Japanese; English summary p. 108, 111. **DWB**—Some micrometeorological properties were observed in large practical frames that were covered respectively with vinyl film, glass and oil paper. From Tables 1, 2 and Figs. 2, 3, it is recognized that the existence of two active surfaces (surfaces of the ground and cover of the frame) and the physical qualities of the covers have a significant effect on the micrometeorology in the frames. In this report the writer treated mainly the following problems on the small model frames: (a) Change of cover transmissibility for heat radiation with solar elevations (Table 1). (b) Relation between the positions of straw-mulching layer and the night temperature in the frame (Fig. 3). (c) Diurnal variation of the relative humidity and vapor pressure in each frame (Fig. 4). (Same item as 6.9-291, Nov. 1955, MAB.) *Subject Heading: 1. Microclimatology of frames.—Authors' abstract.*

7B-211

551.584.61:695

Kerner, G., **Neuere Dachkonstruktionen und ihre Auswirkungen auf die Innentemperatur in tropischen und subtropischen Gebieten.** [New roof constructions and their effects on the indoor temperature in tropical and subtropical regions.] *Germany. Deutscher Wetterdienst, Die Witterung in Übersee*, 2(3):1-3, March 1954. 3 figs., 3 refs. **DWB**—Eight types of roof are illustrated: flat and sloping, with and without air spaces and ventilation. As an index of indoor comfort, diurnal variation of temperature 1 mm below ceiling in Israel is shown, an unwhitened flat roof showing up worst (range of 24-34°C compared with air temperature range of 25-29°C), and whitened roof with hollow spaces ("betkal" roof) best (25-27°C). Ventilated roofs are not helpful because by day the air temperature is too high and by night there is too little wind. *Subject Headings: 1. Indoor climates 2. Roof construction.—C.E.P.B.*

7B-212

551.586:69 551.584.61

†Landsberg, Helmut (Air Force Cambridge Research Center), **Bioclimatology of housing.** *Meteorological Monographs*, Boston, 2(8) 81-98, Oct. 1954. 4 figs., 26 tables, 97 refs. **DWB**—The

author presents a very thorough and clear analysis of the climatic function of houses. The relationship between housing and climate is considered from three aspects: namely the house as a protection against catastrophic weather phenomena, the influence of the individual meteorological variables upon housing and the indoor climate of houses. The discussion covers action of wind force, gales and snow upon structures, the effect of houses on wind currents, the radiation received by houses, the heat transfer of houses, the chemical composition of indoor air, the aerosol in room air, indoor ventilation, the relationships between indoor and outdoor radiation, the effective temperature concept as an index of climatic comfort and the temperature distribution within houses and its relationship to outdoor temperatures. Relevant empirical equations are presented and an extensive bibliography is included. *Subject Headings:* 1. Indoor climates 2. Building resistance 3. Building influences 4. Climatic comfort.—I.L.D.

7B-213

551.584.6:629.123

Macht, Hans G., *Die Abkühlung warmer organischer Massenladungen durch anhaltende Frischluftversorgung der Laderäume. Ein Beitrag zur Schiffsraum-Meteorologie.* [The cooling of warm organic cargoes by continuously supplying the hold with fresh air. A contribution to ship-hold meteorology.] *Der Seewart*, Hamburg, 15(6):212-219, Dec. 1954. fig., 8 refs. DWB—Electrical temperature, humidity and wind instruments have been used by the Seewetteramt since 1951, and earlier observations (1934/5) evaluated to determine the effects of ventilation and cooling of cargo, such as wheat and rice, on spoilage. References to 8 articles written in German (1951-54) on cargo ventilation are cited. A nomogram is presented showing rate of cooling from 0 to 50 cm depth in grain cargo when the surface is cooled suddenly from 30° to 20°C. In 10 days a cooling of 6° occurs at 15 cm and 2° at 33 cm. (Same item as 6.11-68, Nov. 1955, MAB.) *Subject Headings:* 1. Cargo ventilation 2. Ships' hold climates 3. Marine meteorology.—M.R.

7B-214

551.584.6:551.571

Nidetsky, L., *Untersuchungen der relativen Luftfeuchte in den Räumen der neuen Grazer Universitäts-Hauptbibliothek.* [Investigations of the relative humidity in the rooms of the new Graz University Library.] *Wetter und Leben*, 6(10/12):220-222, 1954. DLC—Observations were made in an underground room from Aug. 31-Sept. 8, 1954, with windows shut and open. It was concluded that ventilation is only an advantage when the external temperature is not higher than the internal. *Subject Headings:* 1. Room climate 2. Library microclimatology.—C.E.P.B.

7B-215

551.574.1:551.584.61

Nolan, Patrick J., *The disappearance of condensation nuclei in a sealed room. Remarks on a paper by Smith and Schilling.* *Journal of Atmospheric and Terrestrial Physics*, 5(5/6):345-346, Nov. 1954. 2 tables, 3 refs., 3 eqs. DWB—Data of L. G. SMITH and G. F. SCHILLING (ref. wrongly quoted) can be represented by  $dZ/dt = -\gamma z^2 - \lambda z$ , where  $\gamma z^2$  is loss by coagulation and  $\lambda z$  by diffusion and sedimentation. From data  $\lambda = 5.12 \times 10^{-6} \text{ sec}^{-1}$  and  $\gamma = 2.56 \times 10^{-9} \text{ cm}^3 \text{ sec}^{-1}$ , in good agreement with theoretical values. (Same item as 6.3-235, March 1955, MAB.) *Subject Headings:* 1. Condensation nuclei 2. Indoor effects.—C.E.P.B.

7B-216

551.582.2:72(747,749)

\*[Olgyay, Victor; Olgyay, Aladar; Malone, Thomas F. and Friedman, Don G.], *Application of climatic data to house design.* Wash., D. C., Housing and Home Finance Agency, Div. of Housing Research, Jan. 1954. 152 p. tables, numerous figs. Price: \$1.00, from U. S. Govt. Print. Off., Wash., D. C. DLC—The bulk of the publication consists of reprinting of progress reports made on a project set up at M.I.T. by the Housing and Home Finance Agency. It comprises a collection of 6 reports on various aspects of climate and building design, plus 6 appended reports which represent the expanded results of working groups whose members compiled and devised numerous (>70) charts and diagrams to serve as examples of the manner in which raw climatic data can be presented in a form that is useful for architects, engineers and industrial consultants. The hope is expressed that the work can be extended to other regions of the country (the bulk of the data in this report applied only to the New York-New Jersey area). The six parts are respectively: 1) Human bioclimatology, 2) Regional climate interpretation, 3) Calculation of shading devices, 4) Radiation on various surfaces, 5) The effect of radiation on orientation and site selection and 6) Solar radiation and heat transmission in dwellings. An interesting feature, aside from the usual bioclimatic or comfort charts is the illustration of ideal shading devices for different types of buildings in different climatic regions (Midwest, Pacific Northwest, Florida, Tropics, Central America, Sweden) and regional shading charts and diagrams with detailed analysis or evaluation in engineering terms. Radiation data and charts for various latitudes, seasons, inclinations, sky conditions, and orientations are very complete. The final chapter (by TOM MALONE) gives data calculated in terms of indoor parameters. (Same item as 5.9-9, Sept. 1954, MAB.) Review by Douglas H. K. Lee in *Geographical Review*, N. Y., 45(2):307-308, April 1955. *Subject Headings:* 1. Applied climatic

data 2. Architectural climatology 3. Climatic data diagrams 4. New York-New Jersey area.  
I. Lee, Douglas H. K.—M.R.

7B-217

551.521.1:628.8/9

†Page, J. K., *Solar radiation and the daylighting problem*. Garston, England. *Building Research Station, Note*, No. E 524, July 1954. 22 p. 17 tables, 40 refs. Also: *The application of solar radiation measurements to problems of building design and construction*. Ibid., Note, No. E 526, July 1954. 14 p. table, 28 refs., eqs. Mimeo. DLC—The first paper discusses the relation of illumination to solar radiation with clear skies, bright and dull overcast skies. Many data are collected and much literature cited. Climates are classified according to latitude, type and brightness, utilizing data of sunshine, rainfall, and sky radiation as % of total radiation on cloudless days. Effect of different cloud types and densities, the problem of glare in the tropics, and the luminous efficiency of daylight (including effect of humidity) are discussed. Finally, 15 problems are submitted for consideration by a working party. The second paper discusses briefly radiation and heat transfer at the surface of a building, the design of solar water heaters, and the effect of solar radiation on the physical, chemical and biological weathering of building materials under tropical conditions. *Subject Headings*: 1. Daylight illumination 2. Deterioration of building materials 3. Solar heating 4. Solar radiation effects 5. Tropical housing.—C.E.P.B.

7B-218

551.584.9:591.5

Park, Orlando and Auerbach, Stanley, *Further study of the tree-hole complex with emphasis on quantitative aspects of the fauna*. *Ecology*, Durham, N. C., 35(2):208-222, April 1954. figs., 7 tables, 31 refs. DLC—This study of the tree-hole biotope with special reference to the population of beetles of the family Pselaphidae, that inhabit tree holes, contains an analysis of the microclimate of a tree hole giving temperatures of tree hole mold, tree hole air and air by tree hole, relative humidity of tree hole air and air by tree hole and light intensity of tree hole, forest floor or open sun for given hours of the day. *Subject Headings*: 1. Tree hole microclimates 2. Insect microclimatology 3. Beetles.—I.L.D.

7B-219

551.584.61

Parmelee, George V., *The weather and human comfort in dwellings*. *World Meteorological Organization, WMO Bulletin*, 3(4):146-153, Oct. 1954. table, 10 refs. DWB—Discusses indoor climate and human comfort from point of view of body heat production, loss and adaptability and comfort requirements; and weather and indoor climate (including factors which affect indoor climate, building heat capacity, thermal conductivity, natural ventilation, meteorological data requirements, natural ventilation, solution of thermal circuit or balance equations, and field test data). Analog computers or electrical devices are useful in solving complicated thermal circuit equations. *Subject Headings*: 1. Indoor climates 2. Building design.—M.R.

7B-220

551.521.16

Petherbridge, P., *Meteorological aspects of the daylighting of buildings*. *Dublin Institute of Advanced Studies. School of Cosmic Physics, Geophysical Bulletin*, No. 10, Oct. 1954. 31 p. 20 figs., 3 tables, 30 refs., 3 eqs. DWB—Probable levels of outdoor illumination are utilized in order to convert daylight factors into corresponding levels of indoor illumination. New measurement techniques have been devised based on an empirical sky luminance distribution. Measurements of total solar radiation have been converted into equivalent illumination levels for use in those parts of the world for which actual illumination measurements are not available but solar radiation data exist. Two new instruments are described whereby the daylighting, sun penetration and solar radiation in actual buildings can be conveniently studied. Details are given of an investigation of the daylighting obtainable in a building by reflection of sunlight from the ground and from an opposite building. *Subject Heading*: 1. Daylight illumination.—From author's abstract.

7B-221

551.586:697

*Physiological aspects of the heating and ventilation of houses in Britain*. *Nature*, London, 174(4430):577-578, Sept. 25, 1954. DWB—Account of discussion at the British Association, Sept. 2, 1954. T. BEDFORD surveyed recent studies of thermal comfort and the assessment of environmental warmth. G. P. CROWDEN outlined the climatic factors of body temperature and comfort and discussed the British Standards Institution code of practice. J. R. BROWN described experiments on working conditions in the home, for women washing clothes by hand. A. PARKER spoke on house heating and atmospheric pollution, and J. B. DICK on factors of design and construction affecting heating and ventilation in buildings. (Same item as 6.7-327, July 1955, MAB.) *Subject Headings*: 1. Environmental control 2. Heating and ventilating.—C.E.P.B.

7B-222

551.584.61 (02):631.2:631.67 551.508.79:551.579.5

Searle, Sidney A. (ed.), *Plant climate and irrigation*. Chichester Press, 1954. 154 p. 28 figs., refs. GB-MO—In Ch. 2, Searle, S. A., *Environmental factors in the glasshouse*, discusses optimum conditions of soil temperature, solar radiation, humidity and ventilation in a glasshouse. Ch. 3, Framptom, Francis R., *Growing in a microclimate*. Author discusses distribution and loss of heat in a glasshouse. He favors the "high velocity low pressure hot water systems," in which the temperatures of flow and return are so close that the  $1\frac{1}{4}$ -2" pipes show no significant changes of heating power along their length. Lay-out, including the thermostat control, is illustrated. (For fuller abstract, see item 6.7-4, July 1955, M.A.B.) *Subject Headings*: 1. Greenhouse climates 2. Text-books.—C.E.P.B.

7B-223

551.584.61:631.2

Seemann, J. and Weleccka, J., *Weitere Möglichkeiten zur Regelung des Gewächshausklimas*. [Further possibilities in regulating greenhouse climate.] *Technik im Gartenbau*, Hamburg, No. 3:1-2, March 1, 1954. DA, DLC—The object of a glasshouse is to maintain optimal conditions for the growth of the plants. Temperature should be varied according to intensity of light and the ventilation. Possibilities not yet tried are the use of heat exchangers to warm incoming air by the heat of outgoing air and the increase in CO<sub>2</sub> content of the air, e.g. by a radiator burning propane, which also adds water vapor. *Subject Heading*: 1. Greenhouse climates.—C.E.P.B.

7B-224

551.524:631.2

Seemann, J., *Zur Frage der natürlichen Kühlung von Obstlagerkellern im Rheinland*. [On the natural cooling of fruit storage cellars in the Rhineland.] *Rheinische Monatsschrift für Gemüse-, Obst- und Gartenbau*, 42(6):119-120, June 1954. fig., 2 tables. GB-MO—Many fruit storage cellars are now being built in the Rhineland, relying on natural cooling by outside air. The efficiency of this system in Oct. through April is investigated from a 51 year temperature series at Bonn. The most favorable temperatures are 3-5°C, but the outside air is often above this. During such a period (Dec. 26-29, 1949), outside temperature rose to 11°C, cellar temperature to 7°C. In a stack, variations were less. Only in 4 years did temperature remain below 5°C in a good cellar in Oct. Thermostatic opening and closing of ventilators is recommended as a satisfactory solution. *Subject Headings*: 1. Fruit storage 2. Cellar temperatures 3. Microclimatology of cellars.—C.E.P.B.

7B-225

551.584.65

Seki, Kiyonobu, *On the variation of wind pressure in railroad tunnels*. *Journal of Meteorological Research*, Tokyo, 6(7):296-297, Sept. 1954. 2 figs., 2 refs. In Japanese. DWB—Variations of wind pressure in railroad tunnels are recorded with a stratoscope. *Subject Headings*: 1. Tunnel microclimatology 2. Wind pressure in tunnels.—H. Arakawa.

7B-226

551.5:699.82

†Svendsen, Sven D., *Driving rain: experimental research on the resistance of external walls against rain penetration*. Norway. Norges Byggeforskningsinstitut (Norwegian Building Research Institute), Oslo, St. 601, 1954. 18 figs., 16 refs. DWB—A nicely edited monograph containing a summary of studies on driving rain made in other countries and detailed results of experiments made in Norway, where wind driven rain is a serious factor in building deterioration, etc. The many aspects of driving rain, such as size of drops, intensity of rain, momentum, angle of incidence, wind pressure, humidity or drying conditions, previous rain (saturation of material), upward components, etc. are considered. Studies made with (a) masonry and (b) frame walls, indicate that capillary suction and wind pressure are the two most important causes of water penetration. Thus, although greatest quantities of rain come from SW, the strongest winds and hence greatest damage comes to NW exposures (in Trondheim). A program for future study is expounded and many illustrations and graphs giving results of tests are appended. *Subject Headings*: 1. Rain penetration 2. Building resistance to rain penetration 3. Norway.—M.R.

7B-227

551.586:72

Svirskii, V. A., *Po povodu stat'i N. M. Dantsiga "K obosnovaniuu vybora orientatsii okon v pomescheniakh zhilykh i obshchestvennykh zdani."* [Reply on the article by N. M. Dantsig: "Bases for orientation of windows in residential and public buildings."] *Gigiena i Sanitariia*, No. 9:51, 1954. DLC—The author questions the practicability of DANTSIG's suggestions, that no windows be oriented towards the north, west and southwest south of 50°N lat. He points out that DANTSIG has failed to take into account diffuse radiation in his proposals. The unpracticability of DANTSIG's design requirements are pointed out with reference to residential and industrial buildings, hospitals, clinics, etc. *Subject Headings*: 1. Physiological climatology 2. Building climatology. I. Dantsig, N. M.—I.L.D.

7B-228

551.586(54):728

Thoburn, W. C. (*Forman Christian Coll., Lahore*), **House construction and thermal comfort in the subtropics**, [Pt. 1]. *Journal of Scientific and Industrial Research, Sec. A*, 13(11):521-531, Nov. 1954. 6 figs., eqs. Also: **House construction** . . . [Pt. 2]. *Ibid.*, *Sec. A*, 13(12):575-582, Dec. 1954. fig., 2 refs., eq. **DLC**—The first paper considers attainment of thermal comfort in the subtropics of Pakistan and India with due considerations of economic factors. The customary aids to thermal comfort such as evaporative cooling and stoves and fireplaces for heating, the economics of air conditioning for various types of masonry houses (electrified by specific transfers) and the thermal damping effect of various types of houses in Lahore are discussed. A mathematical physical analysis of heat penetration through masonry is presented and the cooling effect of shade and ventilation is discussed. In the second paper the author examines the validity of the commonly accepted notion that high ceilings contribute towards keeping houses cool in summer in the light of a number of theories, and concludes that there is no fundamental need for ceilings more than two or three feet higher than the height of a man. Various improvements for cooling air applicable mainly to middle class group in Pakistan are considered. These include cooling of air directly by evaporation of water, controlled shade, using the heat and cold in the earth, and the heat pumps. *Subject Headings*: 1. Building design 2. Air conditioning 3. Cooling effects 4. India.—*I.L.D.*

7B-229

551.584.6:631.2

Uchijima, Z. and Mihara, Y., **Studies on the physical properties of the frame paper and its effects**. (I) **On the aeration of the frame paper and its effect on the temperature of the seedling bed**. *Journal of Agricultural Meteorology*, Tokyo, 9(3/4):131-135, Aug. 1954. 4 figs., 2 tables, 4 refs. In Japanese; English summary p. 135. Also: Pt. 2, **Temperature and heat transfer in the shallow water covered by frame paper**. *Ibid.*, 10(3/4):113-117, March 1955. 4 figs., 2 tables, 8 refs. **DWB**—The first report describes apparatus for measuring aeration and heat transfer through porous cellulose papers, and results of some experiments on rice seedlings. *Subject Heading*: 1. Micro-meteorology of frames.—*C.E.P.B.*

7B-230

551.584.6:631.56:633.491

Ullig, Siegfried, **Das Problem der Kartoffel-Lagerung in den Niederlanden**. [The problem of potato storing in the Netherlands.] *Landwirtschaftliches Jahrbuch für Bayern*, 31(1-2):95-98, 1954. **DA**—Cooling of potatoes by sucking in cold air at night through an opening at ground level and out at the top. Protection against frost is by insulation. The optimum temperature ranges from 13-14°C. in Aug. to 2-4°C. in Nov. through March. Drying can be prevented by mechanical cooling, which enables potatoes to be kept until July. *Subject Heading*: 1. Potato storage microclimatology.

7B-231

551.524:631.2 631.56:633.491

Wächtershäuser, H., **Das Mietenklima im Winter 1953/54**. [The stack climate in winter 1953-54.] *Germany. Deutscher Wetterdienst, Klima-Schnellmeldedienst*, No. 12:92, March 15-21, 1954. fig. Also his: **Mietenklima wieder aktuell**. [Stack climate again.] *Ibid.*, No. 41:272, Oct. 4-10, 1954. **GB-MO**—In the first article air temperatures in potato and fruit stacks at Giessen, Oct. 1953 to March 1954 are plotted. The stack temperatures were too high in autumn but favorable (2-6°C) in winter in spite of the cold weather. In the second article the author gives technical advice on the storage of potatoes in stacks, including avoidance of frost and disease, and when to cover with straw. *Subject Headings*: 1. Rick temperatures 2. Potato storage microclimatology.—*C.E.P.B.*

1955

7B-232

551.521:061.3

**Applied solar energy**, [Pt. 1]. *Air Conditioning, Heating and Ventilating*, N. Y., 52(12):73-76, Dec. 1955. diag., photo. Also [Pt. 2] *Ibid.*, 53(1):78-83, Jan. 1956. Also: **Solar engineering**. *Ibid.*, 52(12):138-140, Dec. 1955. 3 figs. **DLC**—The World Symposium on Applied Solar Energy at Phoenix, Ariz., Nov. 1-5, 1955, was preceded on Oct. 31 and Nov. 1 by a Conference on Solar Energy—the Scientific Basis, at the Univ. of Arizona at Tucson. About 700 attended the conferences, among whom were delegates from 30 countries. Both conferences comprised 3 sections thermal, photochemical and electrical processes. Noted scientists attending were listed, the abundance of solar energy, units to be used [e.g. the *roof-day* which would be the amount of solar energy falling on 100 sq m or 1075 sq ft of flat surface in a day (1.9 million B.t.u.) is considered a useful unit] and other problems were discussed. In the News section of the Dec. issue several types of solar stills, houses or power plants are described and illustrated. In the January issue (Pt. 2), the advances in various fields of solar energy application reported at the conference are summarized. A fully heated solar house 30 mi south of Tucson at 3,800 ft is described. Also solar heat and radiant cooling (night) equipment is reported. Heat pump collectors add to efficiency. High temperature furnaces, solar stills, mechanical energy, solar cooling, solar water heaters, chemical

conversion and solar batteries are described with many technical details. Developments in the U.S.S.R. are also reported. *Subject Headings:* 1. Solar energy conferences 2. Solar houses.—*M.R.*

7B-233

551.584.65

Dudich, Endre, *A barlang mint gyógytényező*. [Health effect of caves.] *Földtani Közlöny*, Budapest, 85(3):353-359, July/Sept. 1955. 25 refs. Russian and French summaries p. 358-359. **DWB**—Various health effects of caves have been noted by different authors. Most recently the Klutert cave in Germany was generally and officially recognized as a health resort for asthmatic diseases. Climatic conditions in the cave (temperature, humidity, ventilation, radiation, chemical composition, etc.) are described according to H. CAUER's report. The health effect of the cave is attributed to a combination of several bioclimatic factors. Possibilities of similar effects in Hungarian caves are considered. *Subject Headings:* 1. Cave microclimatology 2. Bioclimatology of caves 3. Germany.—*G.T.*

7B-234

551.584

Franklin, T. Bedford, *Climates in miniature: a study of microclimate and environment*. London, Faber and Faber, 1955. 137 p. 10 figs., 8 plates, 11 tables. **DWB**—This well written popular book is mainly based on the author's own experiments. Ch. 2, describes temperatures at different levels in rabbit burrows and in badger sets, hedgehog and birds' nests. In Ch. 13 the microclimates of clothes and frames made of glass and plastic are compared (to the advantage of glass) and principles of artificial heating are set out. Ch. 15, "Microclimates in the home," discusses heat gains and losses in housing and effect of clothing. (For fuller abstract, see 6.8-5, Aug. 1955, *M.A.B.*) *Subject Heading:* 1. Microclimatology.—*C.E.P.B.*

7B-235

631.56:633.491

Grosskreutz, K. H., *Kartoffelmieten im Herbst*. [Potato clamps in autumn.] *Germany. Deutscher Wetterdienst, Agrarmeteorologischer Literaturbericht*, 2(2):42-43, Sept. 1955. **DWB**—Recommends a 10 cm wide layer of straw on ridge and at foot of the stack in summer (to permit evaporation but hold in the cool night air). In autumn a 5 cm layer of blackened soil is placed over the straw covering. *Subject Headings:* 1. Potato storage microclimatology 2. Rick climates.—*C.E.P.B.*

7B-236

551.584.61:628.511

Heiser, Chr. and Kunze, P., *Der elektrische Wind in Zimmerluft*. [The electrical wind in room air.] *Annalen der Physik*, 6 ser., 15(5/6): 249-254, 1955. 5 figs., 9 refs., eqs. **DLC**—The "electrical wind" is of interest in the cleaning of gases. Measurements of the corona and wind movement were made between a point and a flat network distant 3, 6 or 10 cm. With a loading of 0.1 watt peak velocities of 90 (3 cm) to 70 (10 cm) cm/sec were observed, but the total wind is independent of distance. Observations were also made with points inserted in spherical networks of 21 and 33 cm diameter. The mechanical-electrical efficiency of the corona wind is about 1%. *Subject Headings:* 1. Electrical dust precipitation 2. Indoor climates.—*C.E.P.B.*

7B-237

551.509.62:631.2

Kuz'min, —; Nikitin, — and Vorob'ev, —, *Das "Hydro"-Gewächshaus: ein Versuch, die Gewächshäuser mit nicht zu warmen Kühl- oder Abwässern der Fabriken zu heizen*. [The "hydro"-greenhouse: an experiment in heating the greenhouse with cooling or waste water of moderate temperature.] *Germany. Deutscher Wetterdienst, Agrarmeteorologischer Literaturbericht*, 2(2):32, Sept. 1955. table. **DWB**—Investigations in a glasshouse in Sverdlovsk. A sheet of warm water up to 5 mm flowed slowly (0.4-0.5 m/s) over the nearly flat roof and down the sloping sides. This maintains the temperature in the glasshouse at 22-27°C with an outdoor temperature of -28°C. *Subject Headings:* 1. Frost protection of greenhouses 2. Greenhouse climates 3. Sverdlovsk, U.S.S.R.—*C.E.P.B.*

7B-238

551.584.65

Lawrence, E. N., *The microclimatology of caves*. *Weather*, 10(5):152-155, May 1955. 3 photos. **DWB**—Caves are classified into those with one entrance and no through circulation, and those with two or more entrances. The main characteristics are constancy of conditions and high humidity. The air is often ionized and caves are associated with thunder. *Subject Heading:* 1. Cave microclimatology.—*C.E.P.B.*

7B-239

551.584.61:628.511

†Parmelee, George V. (*Am. Soc. of Heating and Air-Conditioning Engineers, Cleveland*), *Applications of meteorological data to indoor climate in buildings*. *American Meteorological Society, Bulletin*, 36(6):256-264, June 1955. 3 figs., 14 refs., 9 eqs. **DLC, DWB**—The description of climate in terms applicable directly to determining the indoor climate is complicated by the heat capacity

of the structure and by the diurnal variations in intensity of the sun, wind and air temperature. The concept of thermal circuit is applied to describe indoor climate; it is based upon the linkage of outer environment, external surfaces and internal surfaces. Various studies on the relationships between indoor climate and human comfort are reviewed and the thermal system of climate and building is analyzed with the aid of thermal circuit diagrams. The thermal circuit qualities such as circuit resistance, including convection and radiation resistance, and the sol-air temperature are analyzed mathematically. The application of circuit analysis in building design in the development of weather design data is discussed. *Subject Headings:* 1. Indoor climates 2. Comfort climates 3. Building design.—*I.L.D.*

7B-240

551.584.61:631.2

Seemann, J., *Ein Beitrag zur Kenntnis des Gewächshausklimas*. [Contribution to the knowledge of greenhouse climate.] Also: Weleczka, J., *Wärmetechnische Beratungen im Gartenbau des Rheinlandes*. [Information on technical heating in Rhineland horticulture.] *Land- und Hauswirtschaftlicher Auswertungs- und Informationsdienst, Bad Godesberg, Schriftenreihe H. 47, 2 Sonderheft Gartenbau*, [1955]. 23 p. 5 figs. Mimeo. GB-MO—SEEMANN deals first with reduction of radiation into a greenhouse, compared with the open. He then discusses the heat balance of a greenhouse and the resulting diurnal variation of temperature on a summer day compared with open. Sec. 3 deals with humidity. Finally, the effects of different types of glass are discussed. WELECZKA goes into questions of cost, soil, heating and other practical considerations. *Subject Headings:* 1. Greenhouse climates.—*C.E.P.B.*

7B-241

629.123.5:629.113

Shipley, E. A., *Deterioration of motor-cars during shipment overseas*. *Marine Observer* 25 (170):227-235, Oct. 1955. 2 figs., 2 tables. MH-BH—Extracts from a paper at the North-East Coast Institution of Engineers and Shipbuilders, Newcastle-upon-Tyne, Feb. 25, 1955. The action of high temperature and condensation during the voyage to Australia in causing rusting, mildew and blistering is described. Experiments in protection since 1949 and observations in ships' holds are described. The factors influencing mould growth and blistering and the effect of various treatments in preventing them are tabulated. *Subject Headings:* 1. Cargo protection 2. Ships' hold climates 3. Automobiles.—*C.E.P.B.*

7B-242

551.524:551.500

Thomas, Morley K. (*Mel. Div., Toronto*), *Method for determining winter design temperatures*. *National Research Council of Canada. Div. of Building Research, Research Paper, No. 16, May 1955*. Reprint from *Heating, Piping and Air Conditioning*, Chicago, May 1955, p. 155-158. 5 figs., 2 tables. Price: 10 cents. DWB, DLC—The method is based upon the probable frequency of occurrence of low temperatures during Jan. The regional subdivision of Canada on the basis of Jan. hourly temperature frequencies is carried out and regional relationships between standard deviation and the difference between the mean temperature and winter design temperatures ( $2\frac{1}{2}\%$  basis) are determined. A table giving winter design and comparative temperatures for four different bases of frequency at 15 Canadian localities and a map with winter design temperatures for Canada are presented. (*Same item as 6.11-231, Nov. 1955, MAB.*) *Subject Headings:* 1. Design temperatures 2. Canada.—*I.L.D.*

7B-243

551.556:551.584.61

Untersteiner, N., *Sogwirkungen in einer Biwakhöhle im Hochgebirge*. [Wind suction in a bivouac cave in the Alps.] *Wetter und Leben*, Vienna, 7(7):156-157, 1955. DWB, DCL—During a training trip into the Alps, preparatory to the Frankfurt Himalaya Expedition of 1955, discomfort (headache and nausea) was experienced by the occupants of a snow cave on the Jungfrauoch, which the men used as a bivouac during winds of 100 km/hr (60 mph) at a temperature of  $-18^{\circ}\text{C}$ . The men were awakened about midnight by a violent shaking or vibration which proved to be due to rapid rhythmic density changes in the cave as the wind, which had increased, blew at right angle to the 15 cm air vent at the cave mouth and sucked air out of the cave. The effects lasted until the wind died down toward morning. *Subject Headings:* 1. Wind effects on caves 2. Snow bivouac caves 3. Physiological effects of wind suction 4. Jungfrauoch, Alps.—*M.R.*

7B-244

551.584.6

Weger, N., *Kellerklima und Temperaturschwankungen*. [Cellar climate and temperature variations.] *Der Deutsche Weinbau*, No. 7, 1955. 4 p. 3 figs., 3 tables. Abstracted from reprint GB-MO—Wine and lager cellars require a uniform temperature (fermentation  $12-15^{\circ}\text{C}$ , storage  $7-11^{\circ}\text{C}$ ) and humidity 96-92%. At Geisenheim a new cellar under the courtyard had too great extremes of temperature and humidity, while the old cellar under buildings was satisfactory. The climate in various rooms of the cellar (built over or not) and forecellar is shown; the main differences were in the winter minima. In the best room the annual range was 27% of the range of soil tem-

perature at 1 m. The frequencies of relative humidity are also shown. The results of rebuilding the bombed wine cellars of Johannesburg Castle are also described. *Subject Headings:* 1. Cellar climates 2. Geisenheim, Germany.—C.E.P.B.

## SUPPLEMENTARY MATERIAL

7B-245

551.584.65

Hauser, Ernst and Oedl, Robert, *Eishöhlen: ein Beitrag zu ihrer physikalisch-meteorologischen Erklärung*. [Ice caves: a contribution to their physical-meteorological explanation.] *Die Naturwissenschaften*, Berlin, 9(35):721-725, Aug. 31, 1921. 3 figs., 2 refs. **DLC**—A general theory is advanced for ice formation and conservation in dynamic caves (various types of such caves are shown in diagrams). The factors considered in this theory are the cooling of rock by winter air and the small rate of warming at the lower cave entrance in summer. Other factors considered in previous theories (evaporational cooling, supercooling by capillary phenomena, cooling by melting and dissolution) are termed "either entirely false or of very minor significance." *Subject Headings:* 1. Cave microclimates 2. Ice caves.—G.T.

7B-246

551.584.65

Roschkott, Alfred, *Über Temperaturverhältnisse in Höhlen*. [Temperature conditions in caves.] *Meteorologische Zeitschrift*, Brunswick, 38(2):33-38, Feb. 1921. fig., 3 foot-refs. **DLC**—Various theories advanced since DE SAUSSURE (1796) to account for ice caves are reviewed, and quantitative observations made by CRAMMER (1892-97) analyzed to show the relative temperatures in various parts of a cave (in Austria) during a cold period and a warm period. These data prove that the effect of a hot spell is not felt in the deepest parts of a cave (except to a slight amount owing to thermal diffusion through the soil), because of thermal stratification of the air in the cave (deep-freeze effect), so although cold air may drain into the cave in cold weather, with the warm air flowing out along the ceiling of the cave, the reverse process does not occur in summer, but a closed circulation exists within the cave. Studies of other authors are reviewed, especially with respect to other types of caves and the circulation therein, which is of meteorological interest. *Subject Headings:* 1. Ice cave theories 2. Cave temperatures 3. Austria.—M.R.

7B-247

551.584.65

Steiner, L., *Die Temperaturverhältnisse in der Eishöhle von Dobsina*. [Temperature conditions in the Dobsina ice cave.] *Meteorologische Zeitschrift*, Brunswick, 39(7):193-199, 1922. 5 figs., 3 tables. **DLC**—Observations were made from Nov. 1911 to Jan. 1919 in an ice cave (at 48°52'N, 20°18.6'E, and 980 m elevation) with a thermograph and hydrograph installed in an English type shelter in the "great ice hall." The cave opens toward the north. The article gives monthly mean temperature for entire period showing the seasonal and annual variations, the average monthly differences between the outside and inside air, the diurnal temperature variation outside and inside micrometeorological variations in temperature and humidity at different heights. *Subject Headings:* 1. Cave microclimates 2. Cave temperatures 3. Dobsina ice cave, Czechoslovakia.—M.R.

7B-248

551.584.6:629.12

Harries, H. D., *Neue schiffsraum-meteorologische Messungen. Zugleich Besprechung von H. Ruge, "Das Verhalten der Lufttemperatur und Luftfeuchte auf einem modernen Kreuzer in den Tropen."* [New meteorological measurements in ship's holds. Together with a discussion of H. Ruge, "Behavior of atmospheric temperature and humidity in a modern cruiser in the tropics."] *Annalen der Hydrographie und Maritimen Meteorologie*, 61(1):13-18, Jan./Feb. 1933. 3 tables, 2 foot-refs. **DLC**—A review of results obtained by H. RUGE from May to Dec. 1930 on a voyage of the modern cruiser "Karlsruhe" through the Mediterranean and Red Sea, to the Indian Ocean and South Africa up the West Coast and across to Rio and up the coast of South America to Pernambuco and then to Santa Cruz. The temperature, vapor pressure, and relative humidity outside and in the various rooms (such as engine room, control room, bridge, or furnace room) of the ship was tabulated for every 2 or 3° of lat. and for a few ports along the route. The highest vapor pressure was 47.2 mm in the furnace room at Pernambuco, and the highest temperature 47°C in the engine room at Massau (in the Red Sea). Sweating of the ship's hold or rooms when cooling off after hot humid tropical conditions is one of the worst features of such voyages. (Original article by H. Ruge in *Veröffentlichungen aus dem Gebiete des Marine-Sanitätswesens*, Berlin, Vol. 22, 1932). *Subject Heading:* 1. Ship climatology.—M.R.

7B-249

551.584.61:551.574.1

Amelung, Walther and Landsberg, Helmut, *Kernzählungen in Freiluft und Zimmerluft*. [Particle counting in free air and room air.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter*,

2(2):49-53, 1934. 5 figs., 16 refs. **DLC**—Graphs and tables show room-air nuclei counts in comparison with free air counts in Taunus Range (near Frankfurt a.M.). Different rooms show counts ranging from 25,000 nuclei per cu cm as in outside air to 20 to 22 times that number in the kitchen or in a quartz lamp therapy room. Vertical distribution of nuclei in ventilated and unventilated rooms, effect of hanging up wet towels, effect of presence of people in the room, effects of activity in a gymnasium (rise for  $1\frac{1}{2}$  hrs and then a drop for 2 hrs), effect of a quartz lamp in increasing nuclei count, etc. are discussed quantitatively. (Same item as A-41, Jan. 1950, *MAB*.) *Subject Headings:* 1. Room climates 2. Nuclei count.—*M.R.*

## 7B-250

551.584.6:629.123.4

Michler, Herbert, *Zur Kenntnis der Luftbewegung in Schiffsräumen*. [On the knowledge of air movements in ships' holds: a contribution of ships'-hold climatology.] *Annalen der Hydrographie und Maritimen Meteorologie*, Berlin, 62(11):457-461, Nov. 1934. foot-ref. **DLC**—Observations were made by the author on a freighter, to determine wind direction and speed in different parts of various rooms or cargo space in connection with the wind direction and speed outside. All aspects of cargo ventilation are discussed. *Subject Heading:* 1. Ships' hold climates.—*M.R.*

## 7B-251

551.584.61:551.510.42

\*Landsberg, H., *Werkraumluft und Gewerkerkrankheiten: ein Überblick über ausgewählte neuere amerikanische Arbeiten unter besonderer Berücksichtigung der Staubfrage*. [Illness in workshops and factories: a survey of selected recent American work with special regard to the dust problem.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter*, Brunswick, 2:35-37, 1935. 2 tables, 17 refs. **DLC**—A review of American literature on relation of pulmonary diseases to mineral or coal dust in air of factories or mines is supported by tabular data on dust count in various kinds of factories or atmospheres: textile, silver, cement, granite, grinding, mineral and coal, railroad stations, subways, streets, offices, dwellings and (least of all) country air during a thunderstorm (1/4000th as many dust particles as in a grinding room). *Subject Headings:* 1. Factory dust count 2. Silicosis.—*M.R.*

## 7B-252

551.524.36:628.8:551.580

\*Landsberg, Helmut, *Eine Bett-Temperatur-Studie*. [A study of bed temperature.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter*, 5(2):66-68, 1938. 6 tables, ref. **DWB**—Careful observations were made with a Six thermometer during 100 successive nights between Sept. and Dec. 1937, of the temperature in a bed (occupied by one adult) in a well aired bedroom while outside temperatures ranged from  $+17^{\circ}\text{C}$  to  $-14^{\circ}\text{C}$ , with room temperatures ranging from  $+12.2^{\circ}\text{C}$  to  $-1.1^{\circ}\text{C}$ . The room temperatures followed closely the outdoor temperatures ( $r = 0.844 \pm 0.026$ ) but the bed temperatures showed poorer correlation with room temperature ( $r = 0.546 \pm 0.031$ ). Nevertheless the bed climate proved to be far from a perfect "shelter climate" as maintained by BREZINA and SCHMIDT, for the maximum bed temperatures were lower when the bed was cold than start with than when warm, and a drop of  $5^{\circ}\text{C}$  occurs toward morning after a rise of an average of  $11^{\circ}\text{C}$  after occupancy. Variability in maximum temperature ( $25^{\circ}$  to  $30^{\circ}\text{C}$ ) and in rise due to body heat ( $2^{\circ}$  to  $20^{\circ}\text{C}$ ) and drop toward morning ( $0^{\circ}$  to  $16^{\circ}\text{C}$ ) in final temperature, and difference between room and bed temperature in morning is shown to be quite large. *Subject Headings:* 1. Bed temperatures 2. Room temperature variations.—*M.R.*

## 7B-253

551.584.61:631.2:551.52

Made, A. and Rudolf, W., *Zweck und Aufbau moderner bewetterter Gewächshäuser und ihr Temperaturgang im Vergleich mit dem des Freilandes*. [Purpose and construction of modern air conditioned greenhouses and their temperature regime in comparison with the open air.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter*, Brunswick, 5(4):145-153, 1938. 10 figs. **DLC**—Large and small greenhouses are described and illustrations showing air-conditioning units presented. Selected examples of conditions in air conditioned and nonair conditioned greenhouses compared with temperature at a microclimatic station nearby, with changing cloudiness and sunshine and at different heights above the ground, and temperature height curves in the air conditioned and nonair conditioned greenhouses, show actual radiation conditions and effectiveness of artificial climates, as well as mean effectiveness. *Subject Headings:* 1. Greenhouse temperatures 2. Greenhouse air conditioning.—*M.R.*

## 7B-254

551.584.9:63

\*Weger, N., *Über Tütentemperaturen*. [Bag temperatures.] *Meteorologische Zeitschrift, Bioklimatische Beiblätter*, Brunswick, 5(1):16-19, 1938. 3 figs., 2 tables, 4 refs. **DLC**—Data for May 26-June 7, 1937, obtained in an orchard at Geisenheim show difference between free air temperature and temperature under various types of bags which were put over fruit trees during pollination to prevent cross-fertilization. Temperatures during the daytime were as much as  $16^{\circ}\text{C}$  higher in the cellophane or wax paper bags, and as much as  $12^{\circ}$  warmer in the gauze bags than in the free

air. Actual temperatures reached as high as 46.6°C (116°F) and as low as 4.2°C (in gauze) when outdoor temperature was 5.1°C. Comparative curves show that from 8 p.m. to 4:30 a.m. it was usually colder inside the cover than out. *Subject Headings: 1. Orchard bag temperatures 2. Bag microclimates 3. Geisenheim, Germany.—M.R.*

7B-255

551.584.65

Mrose, Helmut, *Eine seltsame Höhlenvereisung*. [A peculiar cave icing.] *Zeitschrift für angewandte Meteorologie*, Leipzig, 56(11):350-353, 1939. DWB—Various observations made in a hole 1 m wide and 20 m deep (an old mine shaft) near the top of a mountain (1040 m) near Platten, Bohemia are reported. This hole is the only cave in the Erzgebirge in which perennial ice was observed. The author's observations of temperature and ice structure made in various seasons indicate no significant storage of cold winter air and no noticeable temperature decrease by radiative cooling in the cave. Heat loss by snow melt and impeded heat exchange with outer air appear to be the only factors contributing to the conservation of ice in the hole. *Subject Headings: 1. Ice caves 2. Cave microclimates 3. Platten, Bohemia.—G.T.*

7B-256

551.556:551.584.61:628.8

Warner, C. G., *Measurements on the ventilation of dwellings*. *Journal of Hygiene*, Cambridge, 40(2):125-153, April 8, 1940. 4 figs., 17 tables, 22 refs. Also: Bedford, T.; Warner, C. G. and Chrenko, F. A., *Observations on the natural ventilation of dwellings*. *Royal Institute of British Architects, Journal*, 50, Nov. 1943. [4 p.] 4 figs., 4 tables, 5 refs. Abstracted from reprint. GB-MO—Determinations were made in blocks of flats, villas and a modern university building by liberating coal gas in the room and measuring rate of disappearance with a katharometer. Ventilation in closed fuelless rooms was much below the minimum of 600 cu ft/hr per occupant but it was greatly increased by opening windows even slightly. Of natural factors wind speed was most important. Further measurements, especially of effect of wind speed and direction, are given in the second paper. *Subject Heading: 1. Ventilation of buildings.—C.E.P.B.*

7B-257

551.58(02) 551.584.61

\*†Landsberg, Helmut, *Physical climatology*. State College, Pa., School of Mineral Industries, Pa. State College, 1941. 283 p. 79 figs., 125 tables, bibliog. p. 272-277, 46 eqs. DLC—In Par. 47 (Artificial climate) of this textbook is a concise summary of the problem of shelter climates (houses, rooms, beds, etc.) with supporting quantitative data and schematic diagrams. Par. 50, on Applications of Physical Climatology, covers housing and effects of trees, parks and other buildings, clouds, and variations in solar radiation on comfort of dwellings. *Subject Headings: 1. Room climates 2. Bed climates 3. Architectural climatology 4. Climatology textbooks 5. Applied climatology.—M.R.*

7B-258

551.584.6:656.7

\*Hoecker, R. W.; Brittin, L. H.; Johnson, Harold D., et al., *Air transport of agricultural perishables*. U. S. Dept. of Agriculture, *Miscellaneous Publication*, No. 585, Jan. 1946. 44 p. 4 figs., 17 tables, 13 refs., also foot-refs. DWB, DA—Among other items in this bulletin regarding air cargo, effects of temperature and pressure on vegetables, fruits and flowers shipped by air are mentioned. Adverse effects can be eliminated by proper packaging. For instance flowers can be damaged by crushing when reduced pressure exhausts air from containers and allows collapse when pressure increases again. Sample temperatures on flights to 11,000 ft (across country) and down again at terminals along TWA routes are given for June 1944. Temperature outside, at floor, 10 in. above floor, and at center of crate, and relative humidity near crate are given for several days in June 1944. It is shown that savings can be made over rail shipment because refrigeration can often be eliminated if packaging is right and shipment prompt. *Subject Headings: 1. Air transport of perishables 2. Air cargo temperatures 3. Cargo plane microclimatology. I. U. S. Interbureau Committee on Postwar Programs.—M.R.*

7B-259

551.571.36:355.8

Sissenwine, Norman, *Humidity aspects of climatic extremes for combat items*. U. S. Quartermaster Corps. Research and Development Branch. Environmental Protection Section, *Special Report*, No. 35, March 26, 1950. 8 p. Mimeo. DWB—A few facts concerning extremes of relative humidity, absolute humidity and dew point under various climatic conditions or types of operation and possible duration of such extremes are outlined along with notes on the importance or effects of humidity on various types of materials. Worldwide extreme high absolute humidity of 13 grains/cu ft, or a dew point of 85°F (29.5°C) is found in Arabia on the Persian Gulf. For the Arctic an extreme of 2.1 gr./cu ft (32°F dew point) is considered the upper limit. The lower limit for air-borne operations is an infinitesimal amount of moisture (−135°F with 5% rel. humidity is possible at high altitudes). *Subject Headings: 1. Dew point extreme 2. Humidity extremes for world 3. Deterioration of materials 4. Air cargo microclimates.—M.R.*

7B-260

551.583.15:355.8

†Sissenwine, Norman and Court, Arnold, **Climate extremes for military equipment.** *U. S. Quartermaster Corps. Research & Development Branch, Environmental Protection Section, Report No. 146, Nov. 1951.* 63 p. 6 figs., 6 tables, 94 refs. **DWB**—This report is an attempt to "evaluate and express quantitatively the "environmental extremes that are likely to be encountered in modern world-wide warfare." The environmental factors considered are: thermal stress, including ambient air temperature and radiation load; atmospheric moisture content; precipitation, including snow load; wind force; blowing sand, dust and snow; salt spray and atmospheric pressure. The evaluations are based upon frequency distribution of the various elements and upon the physics of the behavior. In each of the environmental stresses both most frequent characteristics and extremes are discussed. Graphs and map giving average frequency of daily extreme temperatures in Death Valley in July (1911-1947) and lowest temperatures ever observed, expectancy of low temperatures and average maximum snow depth in the Northern Hemisphere are presented. Also tabular data on maximum rainfall to be expected at various periods for different intervals over the western half of the U. S., snowfall at several localities in the U. S. and maximum wind speed at various localities in the U. S. are included. *Subject Headings:* 1. Climatic extremes 2. Deterioration of equipment.—I.L.D.

7B-261

693:551.579.5

Dawson, Raymond F., **The design of building footings on expansive clay soils.** *National Research Council, Wash., D. C. Building Research Advisory Board, BRAB Research Conference Report, No. 5:83-90, 1953.* 21 figs. Also: Thompson, J. Neils, **A study of structural features in masonry houses.** *Ibid.*, 91-95, 8 figs. **DWB**—Great damage is caused to structures on clay soils in climates with alternating very wet and rainless seasons, owing to expansion and contraction of the clay. **DAWSON** describes a method of construction to avoid this by carrying drilled and underreamed footing below the line of seasonal moisture change. Slab and honeycomb foundations are also satisfactory for small structures. **THOMPSON** describes the construction of a house with flexible honeycomb foundation and masonry walls which has proved satisfactory. *Subject Headings:* 1. Building design 2. Soil moisture effects.—C.E.P.B.

7B-262

551.571.3

Sissenwine, Norman, **Maximum humidity in engineering design.** *U. S. Air Force. Cambridge Research Center, Air Force Surveys in Geophysics, No. 49, Oct. 1953.* 7 p. 5 refs. **DLC**—The impact of high humidity on equipment is analyzed and classified into operational problems and standby storage (deterioration) problems. These two classifications are connected with the various methods of indicating humidity. Operational problems are associated with high *absolute* humidity whereas deterioration problems are associated with high *relative* humidity. An exception, high voltage breakdown, is noted. The various methods of designating humidity are explained. The physical limitation of the absolute humidity is related to the surface temperature of the oceans and other large bodies of water. Data are described substantiating these limitations. Recommendations for the maximum humidities to be considered in military equipment designed for worldwide usage are given. *Subject Heading:* 1. Humidity effects on equipment.—*Author's abstract.*

7B-263

551.524.3:551.584.61:699.86(569.4)

Wittkower, J. W.; Frenkiel, J. and Neumann, J., **Effects of some types of roof construction upon air temperatures close to the ceiling in the late summer months in Israel.** *Israel. Meteorological Service, Series A, Meteorological Notes, No. 12, Dec. 1953.* 18 p. 30 figs. **DWB**—Observations of temperature at lower surface of ceiling were made in Tel Aviv, Aug. 26-Oct. 26, 1950 in various types of house roof. Solid flat roof unwhitened is 1.3°C hotter at 11 h and 1° cooler at 21 h than hollow roof. Whitened hollow block roof is cooler throughout (1.4° at 17 h). Effect of whitening is cooling by 0.6-3°C. Foam concrete was also considered. Tiled sloping roofs with ventilation slits were slightly hotter than whitewashed hollow-block roofs without additional insulation, which are recommended for Israel. Further studies in summer 1951 confirmed these results. *Subject Headings:* 1. Room ceiling temperatures 2. Building construction 3. Israel.—C.E.P.B.

7B-264

551.5(023)

Dési, Frigyes, et al., **A levegőtenger partvidékén.** [On the shores of the ocean of air.] Budapest. Akadémiai Kiadó, 1954. 292 p. 151 figs. Hungary. *Országos Meteorológiai Intézet Népszefű Kiadványai.* **DLC**—This popular science book deals with the applications of meteorology to various human activities such as agriculture, industry, commerce, building construction, transportation, law, sports, and sanitation. The chapter on microclimate in relation to building site (p. 79-91) takes up the problems of orientation, insulation, heating, ventilation, lighting and cooling of buildings. The chapters on transportation and storage of goods (p. 171-208) include sections on problems of air transportation, microclimates of regular and air conditioned freight cars, ships hold

climates and temperature and humidity conditions in storage places. *Subject Headings:* 1. Applied meteorology 2. Micrometeorology 3. Popular meteorology.—G.T.

7B-265

551.571:551.584.6

Gates, Albert S., Jr.; Higgs, George W.; Ebert, Carl J. and Borger, Martin R., **Dehumidification**. (In: Greathouse, G. A. and Wessel, C. J. (eds.), **Deterioration of materials**. N. Y. Reinhold, 1954. p. 719-746. 13 figs. (incl. photos), table, 25 refs.) **DLC**—Warehouse, ship and other storage place dehumidification is discussed in detail, and control equipment, sources of moisture (from materials, walls, floors, humans, etc.), effects of moisture on specific materials (illustrated) protected and unprotected from humidity variations, etc. are discussed systematically. Humidities above 45% are considered harmful to general run of material, and from 65% to 90% the deterioration increases rapidly. Literature is reviewed. *Subject Headings:* 1. Dehumidification of buildings 2. Warehouse climates 3. Ships' hold climates 4. Humidity effects on materials.—M.R.

7B-266

551.524:551.584.61:631.2

Gloyne, R. W., **Temperature under glass**. *Scientific Horticulture*, 11:158-162, 1952/54. 3 figs., table. Abstracted from reprint. **DA**—The soil temperature under Dutch lights in Britain in sunny months compared with the open varies from 2°F higher in Dec. to 10°F higher in June. In very dull months the gain ranges from 0-6°F. At night the gain near the ground in the center of the light is 2-12°F; a further gain of 1-2°F was obtained with a hessian cover at night. *Subject Heading:* 1. Greenhouse temperatures.—C.E.P.B.

7B-267

551.584.9

\*†Greathouse, Glenn A.; Fleer, Bryson and Wessel, Carl J., **Chemical and physical agents of deterioration**. (In: Greathouse and Wessel, **Deterioration of materials**. N. Y. Reinhold, 1954. p. 71-174. 25 figs. (incl. photos), 9 tables, 208 refs.) p. 117, **Moisture**. p. 155, **Wind, rain, hail, sleet, lightning, and other forces**. **DLC**—The major physical and chemical forces producing deterioration of materials, discussed in separate chapters of this article are: 1) solar radiation, 2) oxygen and ozone, 3) atmospheric pollution, 4) moisture, 5) heat and cold, 6) dust and sand, 7) wind, 8) rain, 9) ice or sleet, 10) lightning and 11) general weathering. Effects on stone, concrete, paper, metals, textiles, paint, glued joints, tires, fuel, oil, plastics, dyestuffs, chemicals, wires, buildings, roads and transportation equipment are considered under each appropriate head. Quantitative data are presented in tables or graphs where pertinent. A complete section on relative humidity in closed spaces summarizes work done in the quantitative measurement of diurnal changes in relative humidity (where moisture is constant) or in dew point (where moisture can be evaporated from contents or condensed on surfaces inside container) with the changing outside temperature. A ship's hold is said to be merely a "large container" and hence subject to the same variations. Such variations can result in severe deterioration. *Subject Headings:* 1. Deterioration of materials 2. Climate of packaged material 3. Ships' hold climatology.—M.R.

7B-268

551.571:69

Hutcheon, N. B., **Control of water vapour in dwellings**. *National Research Council of Canada. Div. of Building Research, Technical Paper*, No. 19. [6 p.] fig. Reprinted from *Royal Architectural Institut eof Canada, Journal*, June 1954. **DWB**—The general problem of temperature-relative humidity, dew point and vapor pressure relationships for outdoor air taken into a heated building is discussed and a practical chart presented with examples worked out for summer and winter. Further discussion of dampness in basements, condensation on windows, humidity and condensation problems in houses, vapor barriers, outside walls and humidity in attics and under roof coverings brings out importance of knowledge of humidity behavior in houses, walls and on surfaces. *Subject Headings:* 1. Humidity control in houses 2. Building climatology 3. Water vapor barriers 4. Canada.—M.R.

7B-269

551.584:646

Army seeks answers to human stress problems at Natick Environmental Lab. *Environmental Quarterly*, N. Y., 1 (1):9-11, Fall 1955. 4 photos, table. **DWB**—The importance of various stress factors on the human body exposed to severe climates is emphasized and the work of the U. S. Army at its Natick Quartermaster Research Center is outlined with regard to quantitative evaluation of such stresses as can be controlled. A 190' X 232' climatic building, housing Arctic and Tropic climatic chambers and other special equipment of the Environmental Protection Division, is discussed and illustrated. It allows simulation of temperature from -70° to 70°F (Arctic) and 0° to 65°F (Tropic), humidity from 10 to 90% R.H., wind from 2-40 mph, rainfall of 4"/hr, snowfall of any reasonable depth, and solar or long wave radiation. A Copper Man allows tests of clothing for wind and insulating effects under all conditions except sweating. *Subject Headings:* 1. Climatic controlled laboratories 2. Clothing climate. I. Henschel, Austin II. U. S. Army Quartermaster Environmental Div.—M.R.

7B-270

551.584.43

Matouš, J. and Trefná, E., *Pokusy spodní závlahy hrnkových květin s hlediska pěstitelského a mikroklimatického*. [Experiments on bottom watering of potted plants from the point of view of growing and microclimate.] *Meteorologické Zprávy*, Prague, 8(4):104-106, Aug. 1955. 2 tables, 4 graphs. Russian and German summaries p. 104. DWB—Comparative data on plant development and on greenhouse microclimate are presented for different types of bottom and surface watering. The data were obtained in three identical divisions of a greenhouse (1954), each treated differently. Ambient weather data are also shown. The study reveals that bottom (as compared to surface) watering creates higher temperature at night, more stable and higher humidity of air and soil, and smaller thermal gradient in the soil. Better results in plant growth and substantial savings in time were achieved. *Subject Headings*: 1. Plant climatology 2. Greenhouse climates.—G.T.

7B-271

551.586:628.8

\*Parmelee, G. V. (Cleveland, Ohio); Sullivan, G. E. (N. Orleans, La.) and Cerny, A. N. (Cleveland), *Weather data analysis for cooling system design*. *Heating, Piping and Air Conditioning*, 27(4):135-140, April 1955. 6 tables, 3 figs., 12 refs., eq. DWB—Weather data for New Orleans are analyzed with the aid of the sol-air temperature concept which combines solar radiation, dry bulb temperature and wind velocity in a single meteorological element. The weather data used were those of U. S. Weather Bureau for dry and wet bulb temperatures and wind velocity and solar radiation measurements carried out on the Tulane University campus. The study includes a consideration of the principles in the selection of summer design conditions, examples of selected design conditions including a residence and a theater, and diurnal cycles of temperature, wind speed and direction and solar radiation in the two design conditions and presents the formulas for calculating sol-air temperatures. Tables give three-element frequency analysis of summer weather data, summer dry-wet bulb and dew point temperatures, summer intensity of total solar radiation incident upon a horizontal surface for New Orleans and components of sol-air temperatures for horizontal and vertical surfaces for residence calculation of weather conditions. *Subject Headings*: 1. Building design 2. Air conditioning data analysis 3. New Orleans, La.—I.L.D.

7B-272

551.584.61

Reidat, R. (Hamburg), *Raumklimatische Messungen in Schulen*. [Indoor-climatic measurements in schools.] *Wetter und Leben*, Vienna, 7(8/11):205-206, 1955. fig. DWB—Measurements made in different schools of Hamburg during 1954-55 are analyzed and shown graphically. Effects of heating and ventilating operations on daily march of air temperature are shown vividly. *Subject Headings*: 1. Schoolroom microclimates 2. Hamburg, Germany.—M.R.

7B-273

551.584.65

Saar, R., *Meteorologisch-physikalische Beobachtungen in den Dachsteinrieseneishöhlen, Oberösterreich*. [Physico-meteorological observations in the Dachstein giant ice caves in Upper Austria.] *Wetter und Leben*, Vienna, 7(8/11):213-219, 1955. 3 figs. DWB—Various observations and measurements (temperature, humidity, ice thickness) made in the Dachstein ice cave since its discovery in 1910 are discussed with particular attention to relations between cave climate and ambient conditions. After considering such factors as the effect of high summer temperature on the cave temperature, the influence of atmospheric pressure changes on air currents through the cave, etc., the author reaches the general conclusion that extremely warm summer and cold winter temperatures (continental-type climate) promote ice formation in the cave, while a moderate (marine-type) temperature regime leads to a deterioration of cave ice. *Subject Headings*: 1. Cave microclimates 2. Ice caves 3. Dachstein ice cave, Austria.—G.T.

7B-274

551.584.61:636.4:697

Sainsbury, D. W. B., *Essentials of pig house design*. *Farmer and Stockbreeder*, London, 69(3437):55, Sept. 6-7, 1955. 5 figs. DA. Also: *Pig mortality rates slashed by new housing system*. *Farmers Weekly*, London, 43(11):75, 1955. DA—Construction diagram and photo of a small well ventilated piggery, without draughts, dry and well insulated. *Subject Heading*: 1. Pig shed design.—C.E.P.B.

7B-275

551.584.61

Undt, W. (Vienna), *Der Tagesgang des Raumklimas*. [Daily variations of room climates.] *Wetter und Leben*, Vienna, 7(8/11):207-209, 1955. 7 refs. DWB—A general discussion of ideal room temperatures for various types of activity, states of health, times of day, and in various countries (United States up to 24°C, England 17°-22°C). Bed temperatures are also discussed in connection with the diurnal life cycles. *Subject Headings*: 1. Room climates 2. Room temperatures.—M.R.

7B-276

551.584.61

Inaura, S., On the results of observations in the new treasure house "Shōsōin," Pt. 1. *Journal of Meteorological Research*, Tokyo, 7(5):305-308, July 1955. 5 figs., table, 4 refs. In Japanese; English summary p. 305. **DWB**—In order to protect treasures against fires and earthquakes a new house was built in the compound of "Shōsōin," and observations was made in this new treasure house from July to Oct. 1953 to determine the conditions suitable for the preservation of treasures. From the data, we obtained the following results: 1. The minimum temperature in the treasure house is higher than the mean temperature in the open air. But both vary in phase. 2. The maximum humidity in the treasure house is generally lower than the mean value in the open air. 3. Diurnal variations of temperature and humidity are very small. 4. Compared with the old treasure house, the meteorological conditions in the new treasure house seem to be similar to those in the old fashioned chest (so-called Karabitsu). *Subject Heading: 1. Museum climates.—Author's abstract.*

7B-277

551.584:646 551.584.61

Pettenkofer, Max Joseph von (1818-1901), The relations of the air to the clothes we wear, the house we live in, and the soil we dwell on. Three popular lectures delivered before the Albert Society at Dresden. London, 1873. 95 p. figs., tables, refs. **DLC**—Translated by Augustus Less from *Beziehungen der Luft zu Kleidung, Wohnung und Boden*. Reprinted in Hef 1 of *Populäre Vorträge von Dr. Max v. Pettenkofer*. Braunschweig, 1877. **DSG**—In the first lecture, which might be entitled "Clothing climates" and published today as the result of new findings, the entire subject of environmental modification by clothing is discussed on a quantitative as well as descriptive basis. The effects of radiation, evaporation and conduction in heat gains and losses by the body are considered of first importance. The physiological changes resulting when the body is heated or cooled from outside are also considered as well as respiration and perspiration, ventilation of the body creates its own convective currents when in a cool room, especially when clothing is loose), water vapor content of air, effect of using different types of cloth on cooling and heat retention, effect of insulating layers of air and cloth, and of hairs on outside of fur on conduction, convection and radiation from body, and effects of color or sizing on cloth. The reported results of experiments by Dr. KRIEGER who used metal cylinders covered with various materials to determine heat losses under different environmental changes are reminiscent of the "copper man" used in the last decade by the U. S. Quartermaster Corps. Even the climate of the bed is considered. In the second lecture the subject of room climate is treated, with emphasis on the movement of air in the room and through the walls and cracks in doors and windows, and the moisture movement through the walls, etc. in different conditions of contrast between outdoor and indoor temperature, pressure and porosity of walls; the elimination of excess CO<sub>2</sub> is also considered quantitatively. The subject of artificial ventilation in hospitals, prisons, barracks, schools, theaters and factories as well as homes is the final consideration; and the controversy over harmful effects of draughts vs. the beneficial effects of ventilation is discussed rationally. Tents are considered as merely "stationary clothing." *Subject Headings: 1. Clothing climate 2. Room climates.—M.R.*

7B-278

551.584.61:625.1

\*Porter, W. L., Recent and current work on high temperatures in storage and transportation. *Research and Development Associates. Food and Container Institute, Chicago, Proceedings*, 7th annual meeting, pub. [1954?] reprint of 9 p. 2 figs., table, 2 refs. **DLC**—Studies of the Environmental Protection Division, U. S. Quartermaster Corps, are directed at (a) extreme temperatures, (b) cumulative temperatures and (c) correlation between inside and ambient conditions. Basic principles involved in such research and results obtained so far are briefly reviewed. The results include temperature data determined from field tests, questionnaires, or literature on various types of army warehouses, dumps, tents, boxcars and shipholds. Effective mean yearly temperatures in Army warehouses at numerous places in the United States and possessions in 1949 are shown on one map, and the same type of presentation used for effective mean monthly temperature in Army warehouses during the hottest month of 1949. A table shows extreme temperatures in storage or transit observed or reported in literature in the SW Pacific, India, Arizona, Texas, Calif. and Virginia. *Subject Headings: 1. Storage climates 2. Warehouse microclimatology.—G.T.*

7B-279

551.584.61:625.1

\*Porter, W. L., Occurrence of high temperatures in standing boxcars. *Research and Development Associates. Food and Container Institute, Chicago, Proceedings*, 7th annual meeting, pub. [1954?] reprint of 24 p. 11 figs., 10 tables, 2 refs. **DLC**—Temperature measurements made in summer 1953 in a boxcar in Yuma, Arizona, and in cartons inside the car are tabulated and analyzed in conjunction with ambient temperature. Absolute maximum temperature reached was 114°F outside, 152° in the car near the roof and 119° in the most critical carton. Temperature of food was

consistently 6 to 7 degrees below carton temperature. Minimum temperatures and frequencies of specified temperature amounts are also given. *Subject Headings:* 1. Package microclimates 2. Freight car temperatures.—G.T.

7B-280

551.584.6:677

\*Miller, David H. (*Camp Lee, Va.*), **Temperature and humidity conditions encountered in exposure tents.** *U. S. Quartermaster Corps. Research and Development Branch, Textile Series, Report, No. 16; Tent Research, Report, No. 2, Summer 1945.* 45 p. photos, tables, graphs. DWE—In order to study effects of weathering on tent fabrics a systematic observational program was set up in the summer of 1945 (July 15–Sept. 30) at Camp Lee, Va., including microclimatic readings at 5' and 9' above ground in the tent, and complete observations in the open air and in the fabrics of exposed panels. Cloud and precipitation conditions were considered in grouping observations for analysis. It was found that maximum temperatures of 140°F were common and a maximum of 156°F was observed once at 9' level. At the 5' level, day temperatures were 120° to 130°F. Gradients on sunny days were very steep and the rate of warming and cooling in a.m. and p.m. about 10°/hr. On rainy days very little warming was observed and gradients were isothermal. Fabrics deteriorate rapidly under such stresses. Complete data, analysis and illustrative material are included in report. *Subject Headings:* 1. Weathering of materials 2. Textile temperatures 3. Microclimate of tents 4. Camp Lee, Virginia.—M.R.

7B-281

551.584.61

Sissenwine, Norman, **Micro-climate in and about tents.** *U. S. Quartermaster Corps. Research and Development Branch, Textile Series, Report, No. 47; Tent Research, Report, No. 4, Winter 1945/1946.* 66 p. 29 figs., 10 tables, 10 refs. DWE—Continuing the observations in and around tents, begun in the summer of 1945 by D. H. MILLER (see 7B-280), elaborate measurements of all meteorological variables in the free air (hourly measurements of wind direction at 7 and 21 ft elevation, of clouds, hydrometeors, visibility, ground temperatures; continuous readings of wind speed at 7 and 21 ft, amount and intensity of rain, insolation, temperature, and humidity); temperature and humidity in tents made of O.D. and white painted canvas (17 pairs of tents of 6 panel-roof wall-type) at 1, 5, 7 and 9 ft with thermographs, etc., were made during Dec. 1945, Jan. & Feb. 1946. Temperatures on sunny days even in winter, in O.D. tents, were 30°F warmer, and in white tents 20°F warmer than the air temperature. At night the minimum temperatures for both types of tents were about 5° colder than the air. Vapor pressure was 25% higher in tents than in open air. Little vertical gradient was noted in temperature or vapor pressure. O.D. tents absorb a higher percentage of visible radiation than white tents do, but infrared radiation absorbed by the 2 types is about the same. Thus white tents would be cooler in the tropics, and O.D. tents warmer in the Arctic in the daytime, and either type would be about the same at night. The data are presented in detail in the appendix and analyzed thoroughly in text with charts and diagrams. *Subject Headings:* 1. Microclimate of tents 2. Tent temperatures 3. Textile temperatures 4. Camp Lee, Virginia. I. Miller, D. H.—M.R.

7B-282

551.584:6

\*†Grundke, Günter (Jena), **Die Bedeutung des Klimas für den industriellen Standort.** (The significance of climate for industrial locations). *Petermanns Geographische Mitteilungen, Ergänzungsheft, Gotha, No. 255, 1955.* 127 p. 22 figs., tables, 256 refs. numerous foot-refs. DGS—This excellent monograph comprises a thorough analysis of the world's literature on Industrial Climatology, beginning with the work in the early and middle 19th century and continuing with that of the present century, and a catalog of data and climatic effects on various industries. Natural and artificial climates (cave, city and room climates), air conditioning, evaluation of climates for locating industry, effect of ambient conditions on various industries (textile, paper, chemical, film, leather, optical, ceramic, dairying, tobacco, baking, etc., etc.), the usefulness of industrial climatological research and applications of techniques learned in such studies, etc., are taken up in separate chapters in a systematic fashion. The monograph is rich in references to literature, most of which are taken from German sources, and in analytical data for each type of industry. Many interesting photographs and other types of visual presentation of data are appended. *Subject Headings:* 1. Industrial climatology 2. Microclimatology of factories 3. Germany.—M.R.

# PART III. REVIEWS OF RECENT IMPORTANT METEOROLOGICAL MATERIAL, AND METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

**Note:** The references to reviews of new books or monographs and the contents of periodicals included in this section are for information only and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of publication, the pagination may be omitted.

## A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERIAL

- Nicolet, M.: *L'aeronomie et sa nomenclature* [Aeronomy and its nomenclature]. [In] *Belgium. Institut Royal Meteorologique, Contribution*, No. 17, 1954. Review by G. Sans Huelin in *Revista de Geofisica*, Madrid, 14(54):201-202, April/June 1955.
- Pepper, J.: *Meteorology of the Falkland Islands and Dependencies, 1944-1950*. 1954. Review by E. Vowinkel in *South Africa. Weather Bureau, Notas*, 4(1):16, 1955.
- Priestley, C. H. B. and Ball, F. K.: *Continuous convection from an isolated source of heat*. [In] *Royal Meteorological Society, Quarterly Journal*, 81(348):144-157, Apr. 1955. Review by F. I. Badgley in *Applied Mechanics Reviews*, 8(12):546-547, Dec. 1955 (no. 3948).
- Physical Society, London: *Report of the Conference on the Physics of the Ionosphere held at the Cavendish Laboratory, Cambridge, Sept. 1954*. Pub. by the Society, 1955. 406 p. Price, 40 sh. Review by [James Paton] in *Royal Meteorological Society, Quarterly Journal*, 81(350):645, Oct. 1955.
- Priestley, C. H. B.: *Free and forced convection in the atmosphere near the ground*. [In] *Royal Meteorological Society, Quarterly Journal*, 81(348):139-143, Apr. 1955. Review by F. I. Badgley in *Applied Mechanics Reviews*, 8(12):547, Dec. 1955 (no. 3949).
- Proudman, J.: *Dynamical oceanography*. London, Methuen, 1953. 409 p. Price, 55 sh. Review by J. Crease in *Deep-Sea Research*, 2(4):287-288, July 1955.
- Rudiger, O. and Dietze, H. D.: *Measurement of thermal conductivity according to Diesselhorst*. [In] *Technische Mitteilungen Krupp*, 13(3):56-61, July 1955. In German. Review by E. R. G. Eckert in *Applied Mechanics Reviews*, 8(12):540, Dec. 1955 (No. 3901).
- Sachet, Marie-Helene and Fosberg, F. Raymond: *Island bibliographies, Pt. 1, Micronesian botany. Pt. 2, Land environment and ecology of coral. Pt. 3, Vegetation of tropical Pacific Islands*. National Research Council of Washington, Publication, No. 335, 1955. 577 p. Price, \$6.00. Review by Frank E. Egler in *Ecology*, Durham, N. C., 36(4):769, Oct. 1955.
- Schmitz, H. P.: *Das Gleichungssystem für den Vertikalaustausch von Wasserdampf und Wärmehalt* [Equation system for the vertical exchange of water vapor and heat content]. [In] *Zeitschrift für Meteorologie*, 8(11/12):352-369, Nov./Dec. 1954. Review by H. Arakawa in *Applied Mechanics Reviews*, 8(9):401, Sept. 1955.
- Schneider-Carius, Karl: *Wetterkunde, Wetterforschung: Geschichte ihrer Probleme und Erkenntnisse in Dokumenten aus drei Jahrtausenden* [Meteorology and weather research: History of its problems and concepts in documents through 300 years]. Munich, Karl Alber, 1955. Review by Richmond T. Zoch in *American Meteorological Society, Bulletin*, 36(8):419-420, Oct. 1955. Review by [Eric L. Hawke] in *Royal Meteorological Society, Quarterly Journal*, 81(350):648-649, Oct. 1955.
- Shapley, Harlow, (ed.): *Climatic change: evidence, causes, effect: papers by 22 authors*. Cambridge, Mass., Harvard Univ. Press, 1953. Review by Gordon Manley in *Deep-Sea Research*, London, 2(3):250-251, April 1955.
- Shaw, Sir Napier: *Selected meteorological papers*. London, MacDonald Ltd., 1955. 275 p. Price, 50 sh. Review by P.A.S. in *Weather*, London, 10(9):313-314, Sept. 1955.
- Spencer, J. E.: *Asia East by South*. London, Chapman & Hall, 1954. 453 p. Price, 68 sh. Review by [R. F. M. Hay] in *Royal Meteorological Society, Quarterly Journal*, 81(350):648, Oct. 1955.

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